AERONAUTICS DIVISION

Southern FLIGHT

Including MODERN AIRPORTS

Aero

OCTOBER 1950

35 cents

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OCT 24 1950

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BEECHCRAFT YT-34 TRAINERS

See pages 24-25

PIONEER CARGO CHUTES

DELIVER THE GOODS

In an actual test Pioneer cargo parachutes, produced by Pioneer, dropped more than two tons of cargo successfully, safely in seven seconds . . . a remarkable example of the efficiency and performance of Pioneer 'chutes . . . designed and constructed to deliver the goods when and where needed. Pioneer Parachute Company, world leader in parachute production, has a special department devoted to the manufacture of cargo 'chutes for every purpose . . . from eight to 150-feet in diameter . . . for any type of cargo that can be dropped from an aircraft.

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Dallas, Texas

PIONEER PARACHUTE COMPANY, INC.

MANCHESTER, CONNECTICUT, U. S. A.

CABLE ADDRESS: PIPAR, Manchester, Conn., U. S. A. TELEPHONE: Manchester 4157

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NEW

Mobilgas Aircraft

80/87

• Now—Coast to Coast—you can enjoy smooth take-off power —maximum knock-free performance—with new, precision-controlled Mobilgas Aircraft 80/87!

• New Mobilgas Aircraft 80/87 now has a rich performance rating of 87 octane. It's recommended or approved by every engine builder!

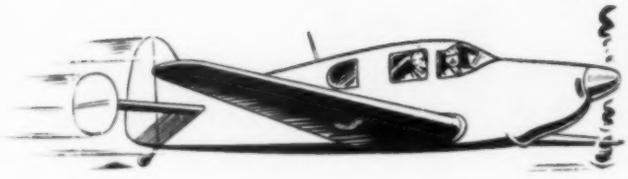
• Look for new red Mobilgas Aircraft 80/87 . . . within cruising range wherever you fly.

MAGNOLIA PETROLEUM COMPANY

Another
Improvement to Keep
Mobilgas Aircraft

Continually NEW

"Easy as Pie to Fly— Gentle as a Breeze"



That's the Cruisemaster!

Pilots Everywhere Acclaim It As The EASIEST TO HANDLE

Here at long last is a conventional personal airplane that every pilot can fly with the greatest of ease! Designed expressly for those who want airline speed and comfort with the simple operation and economy of a trainer, the Cruisemaster is as friendly as a pup and as gentle as old Dobbin in the hands of every pilot. It's the airplane for the whole family, farm and business.

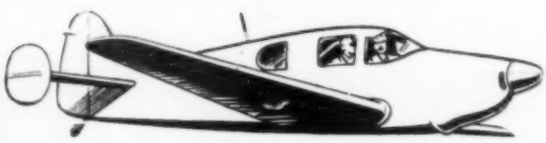
Like all Bellanca's, this newest member of a traditionally fine line of history making airplanes has that built-in, easy gentleness that takes the superman idea out of flying and makes it as effortless as a Sunday afternoon on the front porch. It's the airplane for every pilot, male or female, young or old. See your dealer for a demonstration today or write us for complete information.

PERFORMANCE PLUS! 190hp Lycoming engine 180mph cruising speed. 43 mph landing speed. 1400fpm rate of climb. 700 mile range. Hartzell controllable pitch metal propeller. Radio (VHF optional). Foam rubber seat cushions. Fully adjustable front seats. Controlled cabin ventilation. Cigarette lighter on panel with ash trays at each seat. Fiberglas insulation. DuPont nylon fabric combined with genuine leather upholstery. 4 place-full gas load ease of operation. 80 lbs. baggage. Giant sized 10 cu. ft. compartment approved for 198 of luggage or cargo! Hydraulic retractable landing gear!

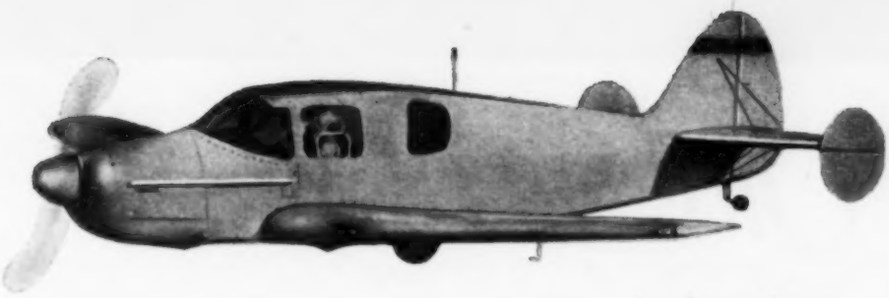
the Cruisemaster

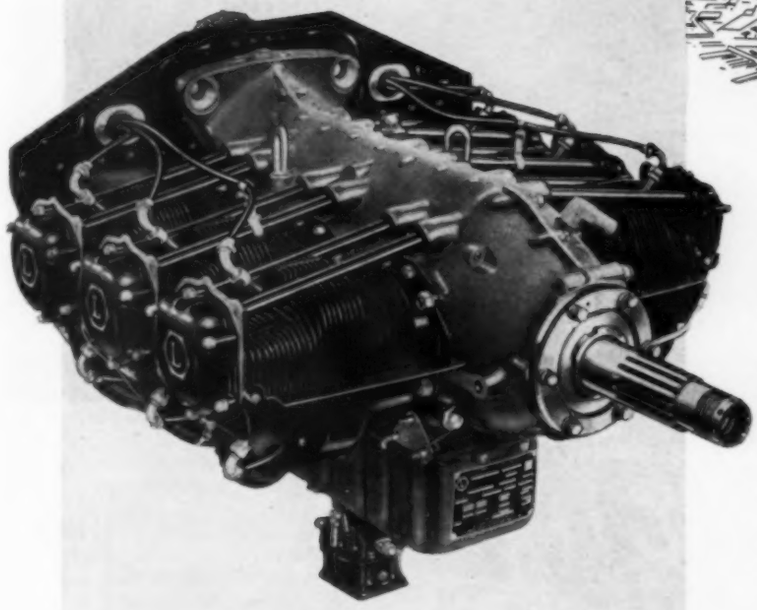
the world's most efficient airplane

BELLANCA



AIRCRAFT CORPORATION • NEW CASTLE • DELAWARE





IN THE LIGHT PLANE FIELD
THE TREND IS TO LYCOMING

LYCOMING
POWERS
THE NEW
BELLANCA CRUISEMASTER

The new high-performance, easy-to-fly Bellanca Cruisemaster is **powered by Lycoming.** This popular plane offers many outstanding features for safety and convenience—quick take-off, low stalling speed, fast climb, and high cruising speed. Its sturdy **Lycoming** O-435-A engine provides steady, dependable operation for smooth, quiet flight—with a high factor of safety. And once again, **Lycoming's** creative engineering and precision manufacturing result in unusually low engine maintenance requirements.

The Cruisemaster's power plant is an improved version of the same rugged 190-horsepower **Lycoming** engine that powered the famous L-5 Liaison Plane under the toughest conditions in every war theatre from the Arctic to the Tropics. You can be sure of your plane when it's . . .

POWERED

BY LYCOMING

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AIRCRAFT ENGINES AND RELATED PRODUCTS • AIR-COOLED INDUSTRIAL ENGINES AND RELATED PRODUCTS
PRECISION MACHINE PARTS • RESIDENTIAL AND COMMERCIAL BOILERS • STEEL PLATE FABRICATION • GRAY IRON CASTINGS

On the way!

Here is the famous Convair Turboliner equipped with Allison T-38 Turbo-prop engines. Preliminary tests of the plane soon will be completed at San Diego, California.

On the way!

PHILLIPS 66 FUELS FOR TURBO-PROP PROPULSION

● Always a pioneer and leader in the development of new, more powerful fuels for conventional engines, Phillips again is breaking trail in the development of fuels for turbo-prop engines.

Our continued research in aviation fuels has led to many significant achievements. Two years ago, for example, we supplied over 30% of the nation's requirement for commercially produced 115/145 grade gasoline. Right now we are supplying large quantities of jet fuel for the country's military planes.

Today, as turbo-prop and jet transports come over the airline horizon, Phillips is ready with fuels and lubricants which are tested and proved to the high standards already set by Phillips *66* Aviation Gasoline and Aviation Engine Oil. The Aviation Department, Phillips Petroleum Company, Bartlesville, Oklahoma.

Phillips 66

AVIATION PRODUCTS

AIR Report

Significant Trends and News

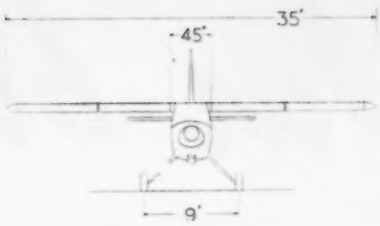
SUBSTANTIAL AERONCA PRICE INCREASES went into effect Oct. 2, a month after H. C. Pettit, factory sales manager, notified distributors of the proposal. New Aeronca FAF prices are $4,995 for the 4-pl. Model 15AC Sedan, $2,925 for the Model 7EC Champion, $2,745 for the Model 7CC Champion and $2,695 for the Model 7DC Champion.

A 1,022-LB. PAYLOAD FOR 125-HP. SUPER CUB has been announced by Piper following CAA notice that payloads exceeding those approved for normal flight may be flown in special purpose activities such as agricultural spraying and dusting. With an empty weight of only 850 lbs., and a gross of 2,150 lbs., the Super Cub takes off in 547 ft. and climbs 552 fpm. from sea level while carrying more load than its empty weight, says Piper. Lightly loaded, it can take off and land in less than 150 ft. and with flaps and power can fly as slow as 35 mph. It is powered with a 125-hp. Lycoming. The payload includes 170 lbs. for pilot, 108 lbs. for fuel and 1,022 lbs. for cargo.

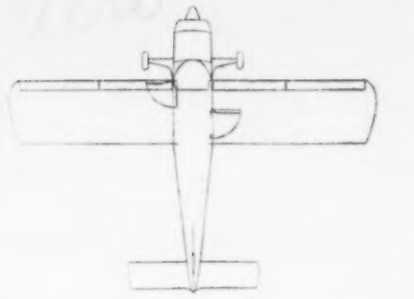
EIGHTY SUPER CUBS WILL GO TO BRAZILIAN GOVERNMENT under a new order just received, increasing to over 600 the total number of Cubs sent to that country over the years. . . . **A TRANS-ATLANTIC FLIGHT IN A PIPER PACER** has been completed by 47-year-old Max Conrad of Winona, Minnesota, to visit his wife and nine children in Switzerland. His route was via Goose Bay, Greenland, and Iceland, and he carried 166 gals. of fuel, Lear ADF, LF and VHF radios, blind flying panel, and 52 lbs. of emergency gear, with a take-off gross weight of 2,300 lbs. for the 125-hp. Piper. Conrad plans to return to Minnesota in the airplane. He has 27,000 hours of flying time in his log.

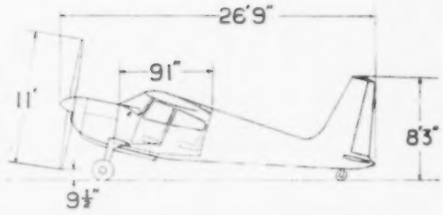
NO NEW MODELS ARE PLANNED BY CESSNA, but improvements may be effected until such time as the firm can make a complete model change. Don Flower, sales manager, says the customary changing of models every January has been indefinitely delayed due to the heavy load in Cessna's engineering and tooling department to take care of military contracts. . . . **TRIPLING OF CESSNA'S USAF ORDER FOR LIAISON PLANES** is rumored but has not been confirmed by the company. Over 400 of the ships are now on order. While tooling up for this, Cessna in September was producing

(Continued on page 30)



HELIOPLANE ORDERS AT $8,800 EACH are being booked but "rising prices may soon force us to cease guaranteeing that figure," says Prof. Lynn L. Bollinger, chairman, in a notice to stockholders of Helio Aircraft Corp., Norwood, Mass. In addition to revealing the price of the 4-pl., 145-hp. (Continental) tube-and-fabric "slow-flight" airplane with metal wing and tail surfaces, Bollinger also disclosed specifications and performance preliminary to CAA certification, expected shortly. These include 1,212-lb. empty weight; 2,062-lb. gross weight; more than 125-mph. cruising speed at 5,000 ft.; under 30-mph. level-flight minimum speed; under 150-ft. take-off and landing distance, and under 450-ft. take-off and landing distance over 50-ft. obstacle. Aircraft hasn't flown yet but is expected to make first flight early in Fall.





Southern FLIGHT

Including MODERN AIRPORTS

OCTOBER, 1950 VOL. 34, No. 4

COVER: Three Beechcraft YT-34 Mentor trainers, delivered to U. S. Air Forces for field tests, are shown in formation. Details on pages 24-25. —(Beechcraft Photo.)

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GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager; E. H. PICKERING, Research; L. M. ROBERTSON, Circulation Manager.

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Our business is everybody's b

America is involved in another emergency, and the nation is gearing for national defense. And once again, industry is demonstrating that the task of building materiel for our armed forces is not confined to a few major contractors. It requires teamwork by all kinds of industry — large and small. National defense is everybody's business.

Nowhere is the need for such teamwork more clearly recognized than in the aircraft manufacturing industry. But it is not teamwork desperately assembled at the beginning of a crisis and quickly disbanded when the crisis is passed. It is practiced in peace, as well as in time of emergency.

For example, Chance Vought Aircraft has been in the business of building military airplanes for more than 30 years. And in all that time it has fostered, as a matter of policy, a close working relationship with a large family of allied companies — large and small, but mostly small. They feed into our plant expertly-made components which we incorporate in the finished airplanes.

Some of these companies make such major items as valves, pumps, moldings, plastics, castings, landing gear struts, forgings, and hydraulic assemblies to Vought's designs. Others supply so-called "government fur-

The network of companies, large and small, which feeds products and services into Chance Vought is nationwide.

CHANCE V

business

nished equipment," which includes engines, propellers, radar, cockpit instruments and all kinds of electronic equipment. Still others fabricate standard aviation products — sheet stock, rivets, machine screws and many others. We also buy goods and services, from electrical power to paper clips, essential in the operation of any business enterprise. Each company, therefore, is an integral part of Vought's business, however small its participation may be.

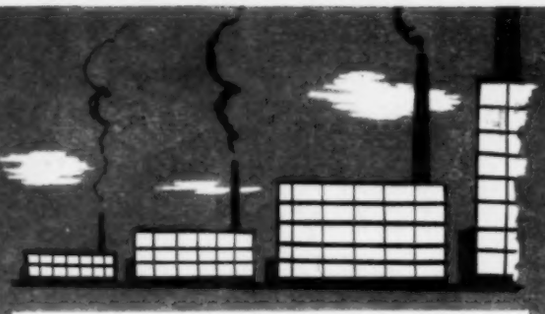
By spreading work among a number of companies in peacetime, Vought remains smaller than it would be if it were manufacturing about everything it needs. Therefore, its expansion or contraction as dollar volume of sales fluctuates, is not drastic. And since Vought is not the only customer of its subcontractors and suppliers, these companies are not seriously disrupted if our business slackens off.

In a national emergency, such as the one we are now facing, this kind of teamwork with little business really pays off. With such a dependable network of skilled subcontractors and suppliers, Vought is equipped at all times to handle, quickly and efficiently, any task that might be assigned by the military services.

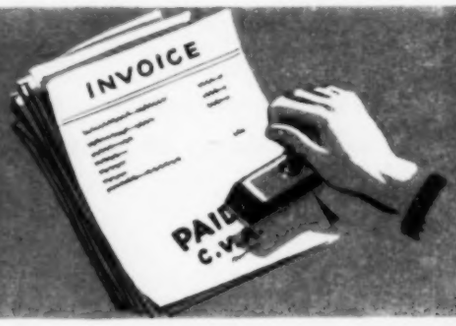
VOUGHT AIRCRAFT

DALLAS, TEXAS

ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION



Chance Vought is an important customer of more than 2,000 subcontractors and suppliers throughout the nation. Most of them are small, employing from 50 to 500 persons. Others are large, some much larger than Vought. Each has a product or special skill we need to help us manufacture intricate, delicate, precision products for modern, high-speed aircraft.



If you want proof of the interdependence of large and small businesses, take a look at the financial side of the picture. Of every dollar received by Vought for airplanes, more than 32 cents is spent for the products of other companies — mostly small ones — on our production team. The amount paid out last year totaled many millions of dollars.

Companies which do work for Vought must adhere to extremely fine tolerances on some products. It is a matter of record that many of these companies, having earned reputations for quality production in aviation, are eagerly sought out by non-aviation manufacturers who want the same quality. This helps them to prosper in peacetime, and preserves skills and manufacturing techniques essential to our national defense in an emergency.

"PACKAGED SERVICES"

for your Beechcraft

thru Factory Certified Service

Service for your Beechcraft at Certified Beechcraft Service Stations consists of many things, all aimed at providing complete satisfaction in your flying.

It means limousine or courtesy car transportation, attention to such details as windshield cleaning and many other extra services which Certified Beechcraft Service Stations take special pride in providing.

Our skilled and efficient Beechcraft factory trained staff, adequate equipment, stock of factory authorized parts and accessories plus economical prices assure the Beechcraft owner of *packaged service* at any of the Certified Beechcraft Service Stations listed.

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Will Rogers Field
Oklahoma City, Oklahoma

Alamo Aviation, Inc.
Municipal Airport
San Antonio, Texas

Amarillo Aircraft
Tradewind Airport
Amarillo, Texas

Anderson Air Activities
General Mitchell Field
Milwaukee, Wisc.

Truax Field
Madison, Wisc.

Atlantic Aviation Service
New Castle County Airport
Wilmington, Delaware

Atlantic Aviation Corp.
Teterboro Airport
(25 minutes from Times Square)
Teterboro, New Jersey

Butler Co., Aviation Division
Municipal Airport
Chicago, Ill.

Washington National Airport
Washington, D. C.

Francis Aviation
Capitol City Airport
Lansing, Michigan

Gray Aircraft Svc. Co., Inc.
D. A. Cody, Service Mgr.
Love Field, Dallas, Texas

Harte Flying Service
Municipal Airport
Wichita, Kansas

Ohio Aviation Company
Dayton Municipal Airport
Vandalia, Ohio

J. D. Reed Co., Inc.
Municipal Airport
Houston, Texas

Roscoe Turner Aeronautical Corp.
Municipal Airport
Indianapolis, Ind.

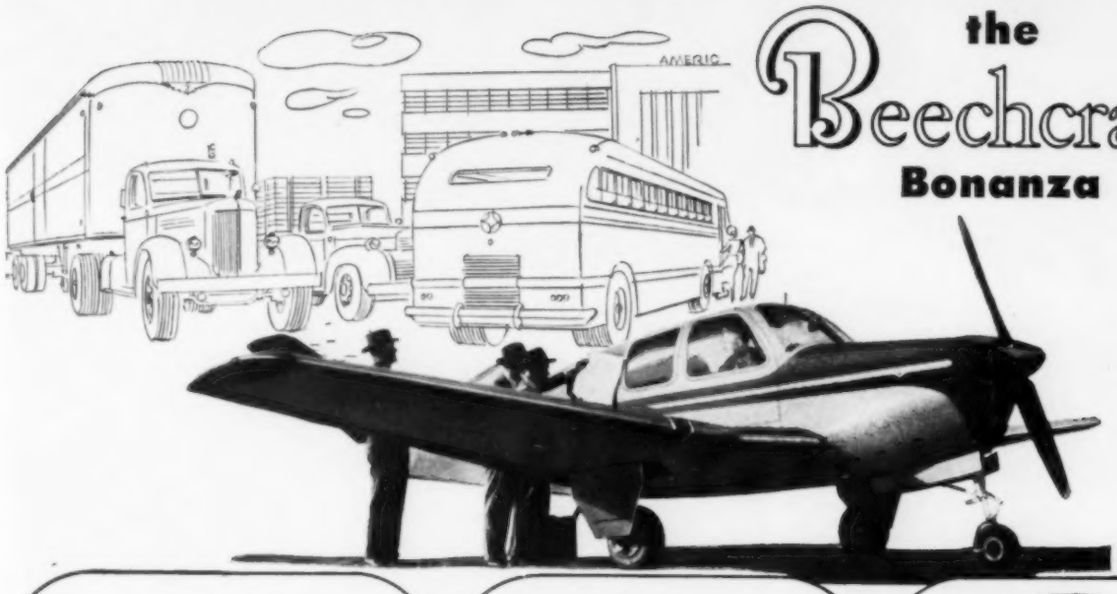
Tulsair Distributors, Inc.
Hangar 5, Municipal Airport
Tulsa, Oklahoma

Wings, Incorporated
Wings Field
Ambler, Pennsylvania

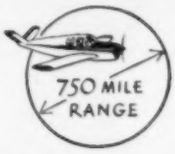
Philadelphia International Airport
Philadelphia, Pennsylvania

Add this "expediter" to your transportation set-up:

the Beechcraft Bonanza



Faster trips. Cruising at a 170-mph clip, your management men can spend *all* the time they need on "field work." You have complete mobility of action—the Bonanza is fully equipped for day and night flights.

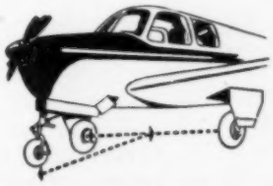


. . . at *longer* range! 750-mile range can be lengthened to 940 or 1,145 miles with installation of 10- or 20-gallon auxiliary fuel tanks. In the Bonanza you can *keep moving* to your destination.

Travel in style—and comfort! The cabin is *soundproofed*, handsomely tailored, and *big*. Four ride in "stretch-out" comfort. W-I-D-E limousine-type door. Arm rests, ash trays for all. Three map pockets.

Takes short fields "in stride." Take-off horsepower rating now 196 h.p. at 2,450 rpm. Landing gear lowered in 7½ seconds, raised in 8½, at 105 mph. New Beechcraft propeller develops greater static thrust.

And just compare this economy! Fuel consumed at "passenger car" rate — 9.5 gallons per hour! Bonanza uses only 56% of engine's rated take-off horsepower at cruising speed. Less wear, fewer overhauls!



Unsurpassed *safety.* Steerable nose-wheel gives greater maneuverability, more positive control. Wide and long wheel base smooths rough field landings. All-metal framework far surpasses CAA requirements.

Features like these have put the Model B35 Beechcraft Bonanza 'way out in front! Get the *full* story about this sturdy, economical business plane from your nearest Beechcraft distributor or dealer today. Or write Beech Aircraft Corporation, Wichita, Kansas, U. S. A., on your company letterhead.

Top speed, 184 mph
Cruising speed, 170 mph
Range, 750 miles
Fuel economy, 9.5 gph

Beechcraft
BONANZA

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

Bill Powell at Lucerne Lodestar's main radio control panels, showing dual audio switching system utilizing ARC F-11 isolation amplifier. Also note VHF transmitter-receiver with selector giving a direct frequency reading. Panel is plug-in type. Pilot Powell received a complete wiring diagram.

Bill Powell KNOWS SUPERIOR RADIO WORK

"Having heard about Southwest Airmotive's executive airplane radio jobs, we gave them the go-ahead for a complete installation in the Lodestar they converted for us. The results have been highly pleasing. For one thing, our VHF system is giving us about twice the range we'd first anticipated. While giving us more range and versatility, our SAC system also gives us new simplicity of operation. For instance, a SAC-made window-and-dial device has eliminated the need for the old-style, hard-to-read frequency interpolation chart. The isolation amplifier with dual audio and cockpit loud speaker operation is also highly advantageous under instrument conditions."

BILL POWELL

Beauty, comfort and dependability combine to make the SAC-styled Lockheed Lodestar operated by the Lucerne Corp. of Dallas one of executive aviation's proudest airplanes. And W. C. (Bill) Powell, when he does such things as use his new radio set-up, is one of executive flying's proudest pilots!

POWELL'S EXPERIENCE IS *your* EXPERIENCE AT—

Representing ARC, Collins, and RCA

Southwest Airmotive Co.

CAA Approved Repair Station No. 195 | LOVE FIELD, DALLAS

Just among ourselves

EDITORIALS

CIVIL AIR DEFENSE PLANNING

VICTORY in Korea might easily turn out to be the trojan horse Russia has been waiting for. Our present danger lies in a false sense of security in which we drop our guard from the real foe who is simply waiting for another opportunity to hit. Signs of this false sense of security are already evident following the September successes on the Korean peninsula. What we must not forget is that our football team has only beaten the orphan's home. We still have to take on Notre Dame.

We are particularly vulnerable in the matter of civil defense. An aroused American public, stirred to a white heat when war broke out last June in the Far East, was ready to go all out and serve in every way possible. That ardor has now waned to a dangerously low point just in a matter of weeks. This is especially true within the ranks of civil airmen, who have suffered the indignity of being omitted, with practically no mention at all, in the National Security Resources Board plan entitled "United States Civil Defense", submitted to President Truman on September 8.

Even so, airmen in many states are taking the initiative in civil defense planning, establishing official civil aviation units on local, regional and state levels, far ahead of other basic elements in civil defense structures. While many such air organizations are actually in a guinea pig, experimental stage, an early exchange of ideas between the states will lead to some measure of uniformity.

State aviation officials are to be congratulated for their initiative in establishing air defense organizations without waiting for direction from Washington. The all-industry sponsored Aviation Development Advisory Committee report entitled "America's Civil Air Power", which was submitted to CAA Administrator Rentzel on August 28, is beginning to trickle down into local civil defense channels, thanks principally to the state aviation agencies. Although the full impact of this report has not been felt, the alertness of civil aviation leaders to the vulnerability of our nation in the present crisis and the recognition of the vital role every airplane, airport and facility will play in realistic defense programs, point to early acceptance of the proposition that our nation's civil air resources are as important as the local constabulary, the local Red Cross or the local fire department. But unless this fact is universally accepted we run the danger of having a bunch of small armies of generals without troops. The old case of too many chiefs and not enough Indians. Civil air defense must include everyone in civil aviation. Not just a few of the top brass who are running the show.

One of the first jobs all of us must undertake is the re-building of Civil Air Patrol. Whether we as individuals decide our personal place in civil defense is in or out of that organization, the time has come to cease sharpshooting at CAP because of weaknesses it developed in many areas during the transition from a pure civilian organization to a civilian auxiliary of the USAF under the direction of the Continental Air Defense Command. As more and more reserve and state air national guard units are called up, the more critical the need for strong civil air defense units. There is neither time nor reason for any clashing of interests between CAP and local and state air councils, which rather must coordinate all problems, activities and assignments with scores of other vital defense groups. We're all in the mess together and on the same team, each with a vital role to play. The soreheads in and out of CAP who continue to blast away at each other must be silenced. They are saboteurs of a patriotic effort. CAP has a lot of house-cleaning to do and must pursue a general beefing-up throughout the forty-eight states but these are no reasons for unfair criticism. Those who engage in this pastime are generally of the breed who contribute nothing themselves to the welfare of aviation or the nation. Either we adopt a mutual-aid procedure between CAP and other civil air defense organizations or we undermine and ultimately wreck our great potential for national service in time of emergency. And when we wreck that, we fall together.

While there is still time left, the big task before us is immediate coordination of all civil air defense planning. The key people in this job are the state aviation officials, the National Security Resources Board, Civil Aeronautics Administration, airport managers, pilot, plane owner and operator organizations and the Civil Air Patrol. It might well be attempted on a state-wide basis in each of the forty-eight states without Washington help or direction. But it is also necessary that all aviation meetings, whether they be of a local or national character, consider at once the need for coordination at all levels so that we won't jump on our horses and go riding off in separate directions. That road leads only to closing of airports, grounding of planes and complete disintegration of civil aviation resources.

CAB'S NEW CHAIRMAN

IN our opinion the Civil Aeronautics Board will be strengthened materially by the President's appointment of CAA Administrator Del Rentzel as the new Chairman. Rentzel's 20-year background in airline operations, aviation electronics and non-professional pilotage as well as his highly successful tour of duty as CAA Administrator, adequately equips him for what is recognized as a tough and thankless job.

The CAA's loss is CAB's gain. Rentzel's energy, influence and sympathetic understanding of critical aviation problems will serve the CAB well.

★ ★ ★

Congratulations to Capital AIRLINES

for new Constellation luxury

Five-mile-a-minute speed of the Constellation, plus beautifully designed, ultra-comfortable interiors, is a hard-to-beat combination.

As a supplier of quality aviation gasoline to Capital Airlines—and now to the Capital Constellation—we take pride in saluting Capital for its great new luxury service.

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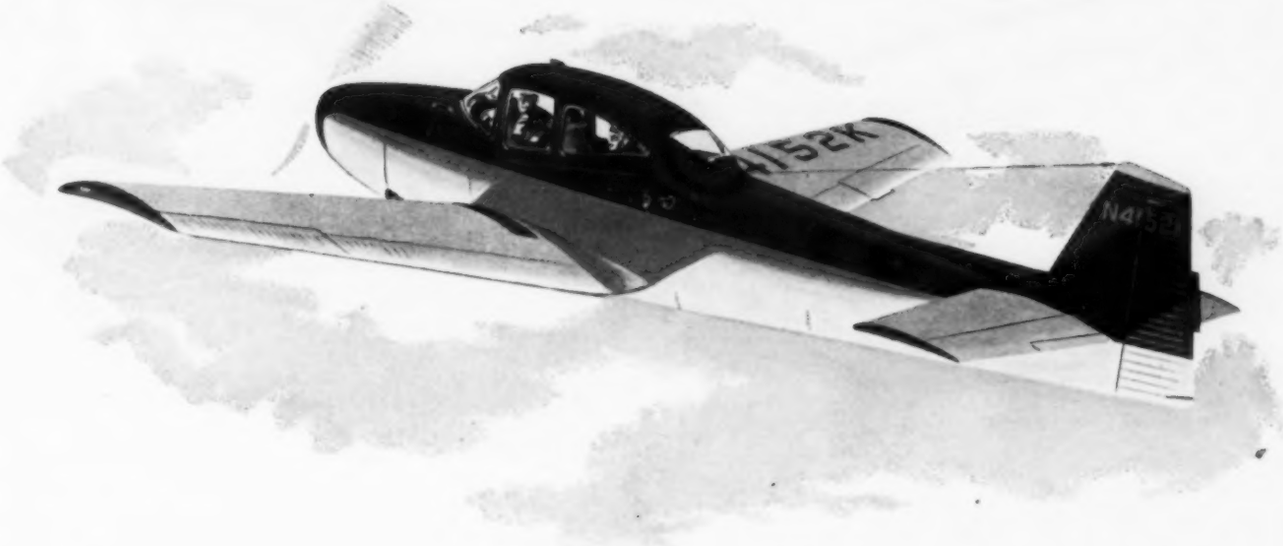
GULF BUILDING · PITTSBURGH, PA.

NOW...*The Better-than-Ever* SUPER 260 NAVION *for* '51



Want the performance thrill of your life? Fly the new, better-than-ever Super 260 *Navion* for 1951! Feel the surging power of the 260-hp Lycoming engine... relax while the *exclusive* inter-connected control system practically flies the 170-mph *Navion* for you. Yes, flying's more fun in the new Super 260 *Navion*. It outcruises, outclimbs, yet lands shorter than other planes in its class. And, for '51—look at these brand new features:

- **NEW...** *More Beautiful Interior Styling*

  Luxurious interiors styled by Charles of California. Beautiful, harmonious colors and fabrics with generous leather trim. Upholstery is extra-thick foam rubber. And the new "reverse flow" ventilating system brings plenty of bracing fresh air into the comfortable, roomy cabin.

- **NEW...** *Exterior Baggage Door*

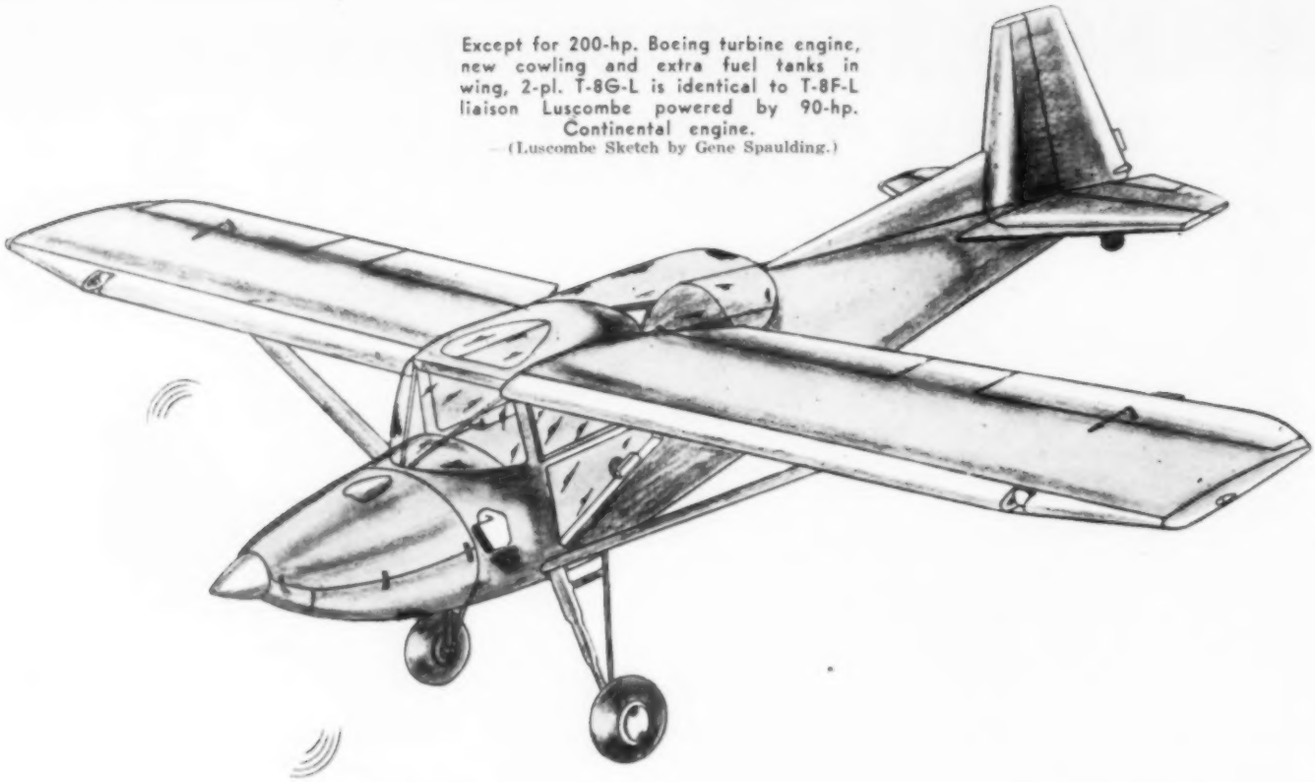
  The new *Navion Luggage Master* makes baggage a cinch to load and unload. No need to climb in and out of plane while loading... do it all from the outside. Luggage Master is equipped with a sturdy lock for complete protection. Folding rear seat affords easy access to baggage in flight.

- **NEW...** All metal selective pitch Hartzell propeller... push-button starter on the dash board...beautiful, new two-tone exterior enamel finishes...sun-visors and curtains for pilot and passengers.

Ryan Navion

NO OTHER PLANE COMBINES SO MANY FEATURES SO WELL

Rely on Ryan RYAN AERONAUTICAL COMPANY, 610 LINDBERGH FIELD, SAN DIEGO, CALIFORNIA



Except for 200-hp. Boeing turbine engine, new cowling and extra fuel tanks in wing, 2-pl. T-8G-L is identical to T-8F-L liaison Luscombe powered by 90-hp. Continental engine.
(Luscombe Sketch by Gene Spaulding.)

Turbo-Prop Luscombe

Boeing's little turbine is considered a 'natural' for liaison planes

By TOM ASHLEY

DESIGN studies have been advanced by Luscombe Airplane Corporation on a military liaison version of the familiar 2-place all-metal Silvaire powered by the small, lightweight Boeing Model 502-2 gas turbine engine with propeller. Known as the Luscombe T-8G-L, the turbo-prop liaison design has been submitted to the U. S. Air Forces at Wright Field and Luscombe's chief engineer, Gus Erickson, says he and his staff are convinced that small prop-jets and lightplanes can be combined to achieve great advantages for military performance at present and for specialized commercial aviation uses later.

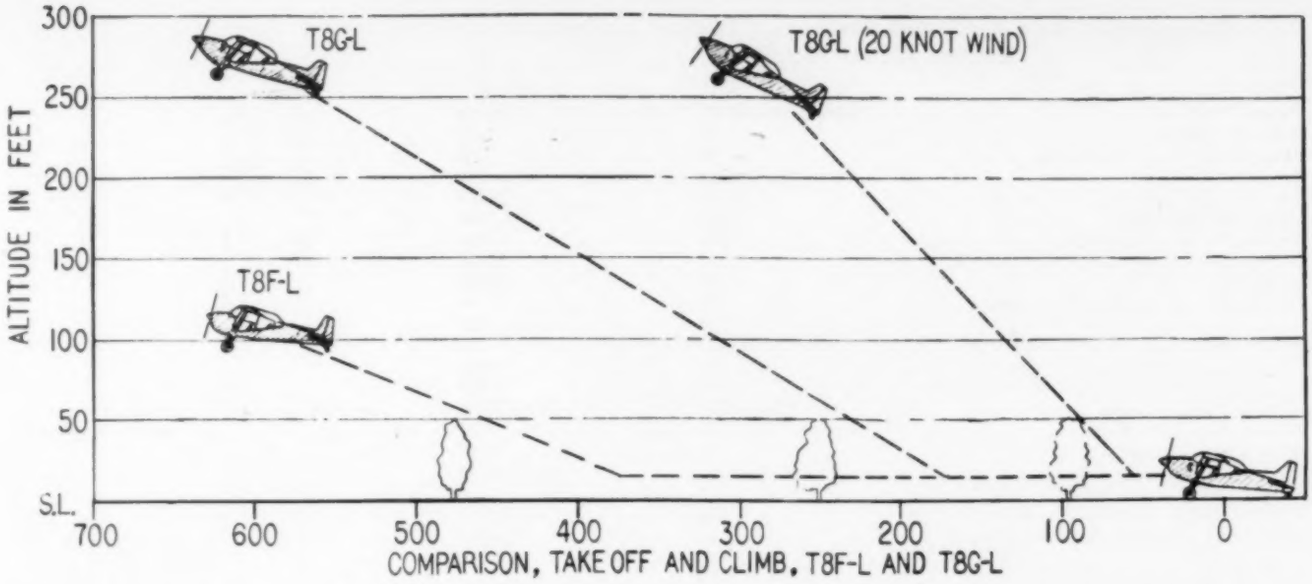
Thus Luscombe has become the first offering to manufacture a turbine-powered lightplane and presenting engineering data for military evaluation. Except for its power plant, the T-8G-L is a replica of the Luscombe T-8F-L liaison airplane powered by a 90-hp. Continental engine. That one was recently evaluated, along with other makes, by the Army Ground Forces in its competition for liaison-type lightplanes. The Luscombe met or exceeded all requirements but a larger, heavier and more powerful liaison type was selected for manufacture. Now comes the turbine-powered version of the Luscombe, with almost twice the original horsepower, and phenomenal performance but with practically the same empty weight of the 90-hp. Luscombe.

Its engine, the revolutionary little Boeing gas turbine, is rated at 200 hp. for take-off and at 175 hp. for maximum continuous operation. This engine has never been used to power an airplane, but it has a background of having powered a large, heavy-duty freight truck, a boat, and several stationary installations. Developed during recent years by Boeing Airplane Company, it has been recommended by the company as being suitable for lightplane utilization.

Fuel consumption is about twice to three times that of a comparable piston engine and is being steadily reduced through continuing refinements—since the war the Boeing's power ratings have jumped over 100 per cent while its fuel consumption has been improved by more than 20 per cent. Offsetting its thirst for fuel is its ability to operate on cheap fuels such as diesel and light oils as well as kerosene and low-grade gasoline. Its compactness and amazing simplicity make it ideally suited for lightplanes and eventual manufacturing economy.

For example, it contains only one-fifth the number of parts that comprise its piston-engine sister. It has none of the sliding parts, the stop-and-start accelerations inherent in all piston engines and in it there is no movement that is more than simple rotation. Combustion is not intermittent and explosive, but continuous and smooth.

Weight, too, is less. The Boeing turbine is about 220 lbs. lighter than the average piston engine of equivalent power rating—in the Luscombe, its installed weight, including accessories and propeller, is exactly the same at 197 lbs. as that of the 90-hp. piston engine it replaces but its power rating is almost twice as high. Its dimensions



Phenomenal take-off and climb claimed for the turbo-prop Luscombe (1,800-lb. gross) is compared in this sketch with that of the same airplane with 90-hp. piston engine, the T-8F-L (1,450-lb. gross). Only 26% of power would be used for cruising T-8G-L.
—(Luscombe Sketch by Gene Spaulding.)

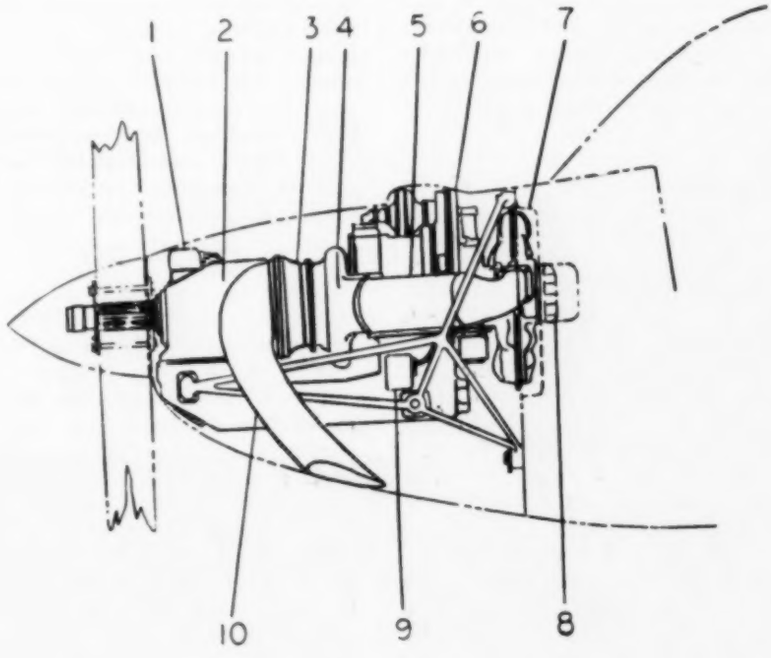
are favorably similar to the less-powered piston engine but are much smaller in every respect than those of a piston engine having equivalent power.

"The Boeing turbine could be used in many existing small aircraft, either as a tractor or pusher installation," says S. D. Hage, chief gas turbine project engineer, and Donald W. Finlay, preliminary design engineer, of Boeing Airplane. "In fact, we hope to make such tests within the next year or so, just to get airplane operating experience."

At Luscombe in Dallas, Chief Engineer Erickson was not concerned with designing a new airframe to carry the little turbine. His design goal was a simpler one—to utilize an existing commercial lightplane design for immediate utilization of the turbine's special virtues in achieving a very high rate of climb, a very short take-off and shortest possible time to climb to a given altitude.

This has been achieved in the Luscombe T-8G-L design study, he says. Whereas the conventional liaison T-8F-L with 90-hp. piston engine and flaps meets or exceeds existing military requirements with an 800-ft.-per-min. rate of climb and a take-off distance of only 550 ft. to clear a 50-ft. obstacle, the turbine version is given a rate of climb of 2,045 ft. per min., and can clear a 50-ft. obstacle in a mere 244 ft.

The T-8F-L's service ceiling is 17,000 ft., but the T-8G-L's service ceiling is 32,000 ft. At the former's ceiling, when its rate of climb is only 100 fpm., the turbine Luscombe is still climbing at more than 800 fpm. or at about the same rate as that of

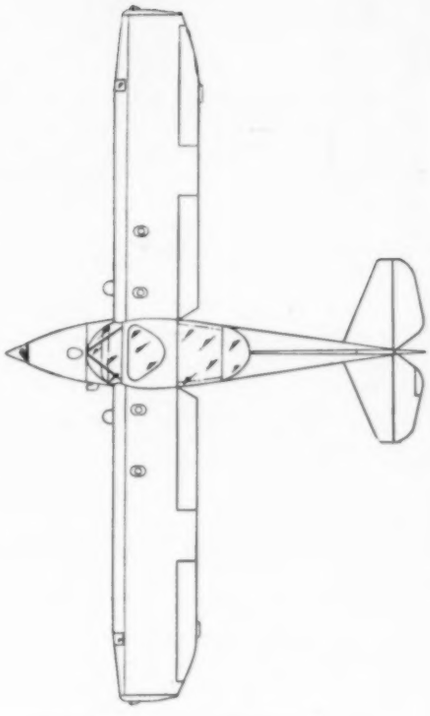


Essential units of the single-stage Boeing 502-2 turbine engine as installed in the Luscombe T-8G-L are illustrated as follows: 1. Output shaft governor. 2. Gear box. 3. Coupling unit. 4. Turbine wheel. 5. Burner (2 required). 6. Accessory case. 7. Compressor. 8. Air intake. 9. Ignitor coil (2 required). 10. Tail pipe (2 required). McCauley fixed-pitch propeller is used, to turn a constant 2,600 rpm. The engine has a built-in infinitely varying transmission operating on principle similar to that of oil-driven torque converter except that gases are used instead of oil. Installed weight of 200-hp. power plant is practically the same as that of 90-hp. piston engine. Optimum fuel consumption is 1.2 lbs./bhp./hr., ranging from 18 gph. at cruising to 32 gph. maximum.
—(Luscombe Drawings.)

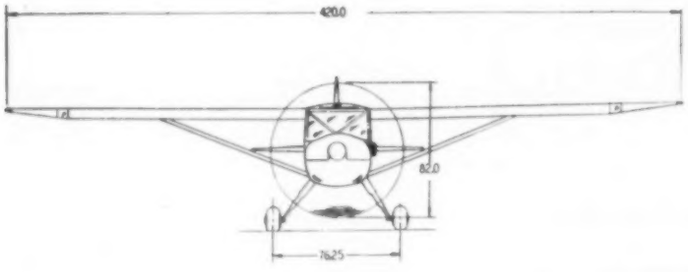
Comparative Data for Piston-Engine and Turbine Luscombe Military Liaison Models

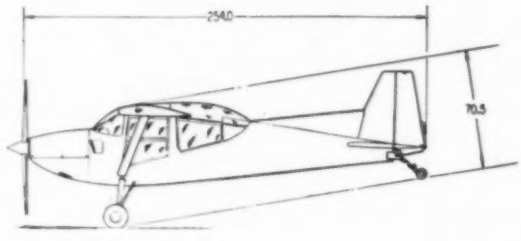
	T-8F-L	T-8G-L
Power Plant	Continental C-90	Boeing 502-2 Turbine
Take-off Rating, hp.	90	200
Max. Continuous Rating, hp.	90	175
Propeller	McCauley	McCauley
Power Plant Installed Wt., lbs.*	265.5	265.9
Gross Weight, lbs.	1,550	1,800
Empty Weight, lbs.	962	960
Wing Loading, lbs./sq. ft.	11.07	12.85
Power Loading, lbs./hp.	17.22	10.28
Span, ft.	35	35
Area, sq. ft.	140	140
Stall Speed (power off), mph.	50	50
Stall Speed (power off, 30-deg. flaps), mph.	45	49.5
Design Cruising Speed, 5,000 ft., mph.	115	115
Cruising Speed, mph.	90 @ 65%	100 @ 26%
Design Dive Speed, mph.	172	172
Fuel Capacity, gals.	30	57
Fuel Consumption, gph.	5.25 @ 65%	18 @ 26%
Best Climb Speed, mph.	63	63
Rate of Climb at T. O. Power, fpm.	800	2,045
Rate of Climb at Cont. Rated Power, fpm.	800	1,734
Service Ceiling, ft.	17,000	32,000
Time to Climb to 10,000 ft., mins.	20	7
Take-off Distance (with flaps), ft.	375	164
Take-off Distance to Clear 50-ft. Obstacle (with flaps), ft.	550	244

*Includes propeller, engine accessories and engine controls. All performance figures are for sea level, zero wind and standard air conditions



Drawings show plan form and dimensions of Luscombe T-8G-L with Boeing turbine engine. —(Luscombe Drawings.)





the T-8F-L back down at sea level. Time to climb to 10,000 ft. is only 7 mins. for the turbine version, 20 minutes for the piston-engine Luscombe; the T-8G-L can reach its 32,000-ft. ceiling in 52½ mins. Angle of climb in relation to the ground is a steep 18 degrees for the turbine Luscombe, or twice that of the T-8F-L. Another revealing comparision involves distance and altitude covered in a climb — with both airplanes covering 1 mile along the ground at maximum rate of climb, the T-8G-L will reach an altitude of 1,734 ft. while the T-8F-L is only 800 ft. above the ground.

Horsepower is the difference, of course. But how to obtain additional horsepower is the problem which Luscombe engineers solved when they utilized the Boeing turbine in their design study. A piston engine of equivalent horsepower would not provide the same performance in this case. Weight and dimensions of the engine would make it impossible to substitute a 200-hp. piston engine for a 90-hp. engine in the same plane and improve its performance as phenomenally as Luscombe engineers say they can do with the T-8G-L. The Boeing turbine is the only engine available with which the accomplishment can be made, because it does not increase the airplane's empty weight and dimensions. At the same time, it provides sufficient additional power to carry 250 lbs. more fuel and thus retain its performance advantages even at a higher gross weight.

Practical Now

"Any way we look at it, this is a 'natural' for the purpose of obtaining greatly increased performance from an existing design," says Erickson. "We can do this in a practical way and immediately—not years from now but within 90 days after receiving turbine engines from Boeing we could start deliveries to the armed forces.

"The Boeing 502-2 and the military Luscombe T-8F-L fit each other ideally. All we have to do is increase its fuel capacity from 30 gals. to 57 gals. to meet existing range requirements. Empty weight would be practically the same for both piston-engine and turbine versions at 962 and 960 lbs., but the T-8G-L's gross weight of 1,800 lbs. would be 250 lbs. more than that of the T-8F-L and this difference is entirely made up of additional fuel. The extra gallonage is easily and readily accommodated in the wing, which can actually carry even more if necessary. We proved this several years ago when we outfitted an experimental 2-place Luscombe Silvaire with 115 gals. of fuel, most of it in the wing. No additional structure was necessary. We have delivered many commercial crop sprayer versions of the Luscombe which carry more weight in fuel and chemicals than the weight of the extra fuel necessary for the turbine version."

Fuel consumption of the turbine Luscombe varies from about 18 gals. per hour at optimum cruise (100 mph.) to 32 gals. per hour at maximum rated horsepower. Improvements already on the way are expected to reduce these figures to 16.2 and 28.8 gals. per hr., respectively.

Erickson emphasizes that this appears to be high mostly because of the

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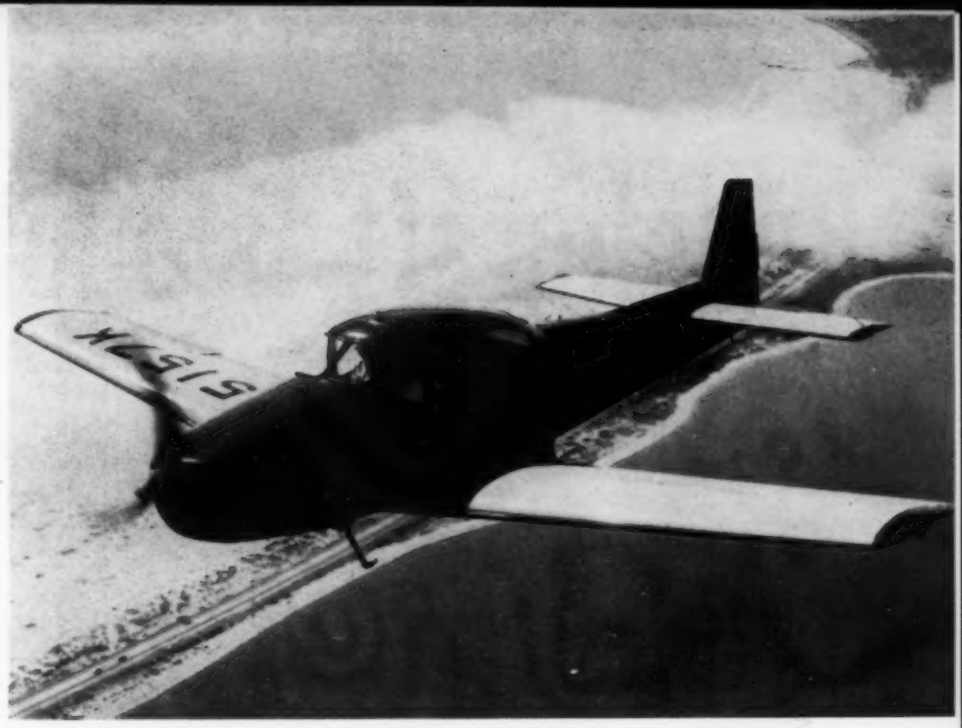


New Super 260 Navions now coming off the Ryan assembly line incorporate significant improvements over earlier model. Two-tone enamel finishes are standard. —(Ryan Photo.)

Super Navion for 1951

FIRST 1951 model personal airplane to be announced is an improved version of the 260 Super Ryan Navion, now coming off the assembly line at San Diego, California. Principal refinements involve a new "reverse flow" cabin ventilation system, more luxurious interior styling, and a new exterior baggage door as standard equipment. A new all-metal Hartzell selective pitch propeller will be available, but probably as extra equipment. Improvements have also been made in other details.

No price had been definitely established in late September. However, Ryan advised distributors that rising costs make a price boost appear almost certain and that on $1,000 deposits it will give customers protection on delivery and price not to exceed $14,485, which is $500 above the 1950 model's price.

Prior to bringing out the new model, Ryan obtained suggestions from many owners, distributors and dealers. The new ventilation system brings cabin air inside from an adjustable scoop at the rear of the canopy. It is then forced forward through the cabin, pushing "dead" or heated air ahead against the firewall, where it is sucked out by external vents located forward of and beneath the instrument panel.

The new interiors provide what is, in effect, custom upholstery as a standard item. Styled by "Charles of California," the new interiors feature generous amounts of red, green and gray leather trim at wear points with soft but durable harmonizing fabrics. Side panels are of pleated broadcloth and seats and seat backs are of pleated barkweave. Thicker foam rubber is used throughout for more comfort. Map pockets are now built into seat backs. New exterior two-tone enamel finishes include Chariot Red and Ivory with red interior; Hawaiian Bronze and Beige with green interior, and Pacific Blue and Ivory with blue interior.

Easier loading and unloading of baggage is provided with the new "luggage master" exterior baggage door. The baggage compartment is still accessible also from the cabin by tipping forward the divided rear seat back-rest. Easier access to the battery is also provided by the baggage door.

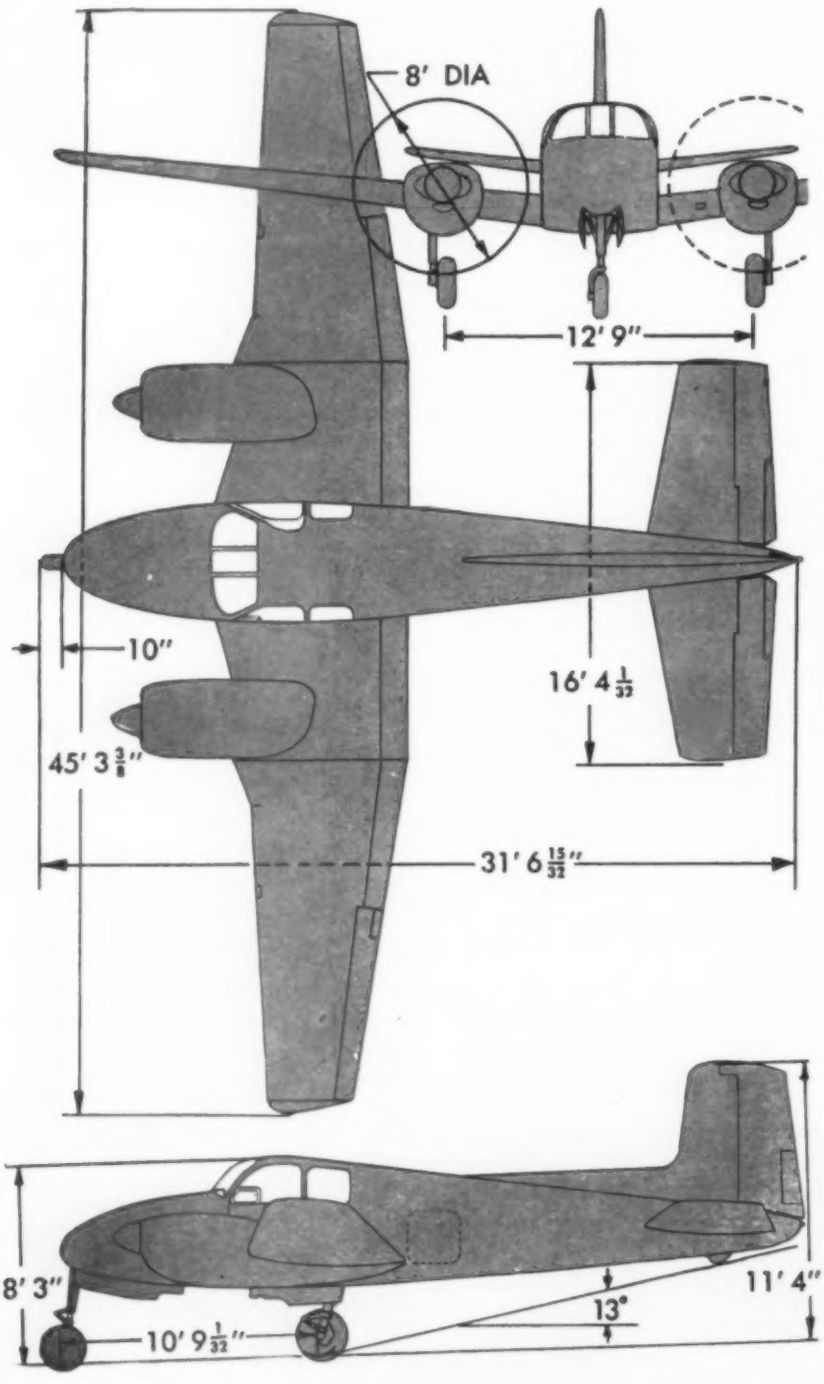
A push-button starter is incorporated in the instrument panel and the manifold pressure dial has been changed for easier reading. For positive identification by feel, the carburetor heat control now has a square knob while the mixture control knob is

(Continued on page 41)

New upholstered cabin interiors are equivalent of custom jobs but provided as standard equipment, as is new outside baggage door (right). Upholstery features extensive use of leathers for wear-points and trim with broadcloth and barkweave fabrics and larger amounts of foam rubber cushioning. —(Ryan Photos.)

Beechcraft Model 50 Twin B

With demonstrations for the armed forces under way, Beech makes public first complete deta



ALTHOUGH commercial deliveries are not scheduled to begin until next Spring and are subject to mobilization requirements, military interest in the new Beechcraft Model 50 Twin Bonanza has resulted in release by the factory of many heretofore undisclosed details of the high-performance, six-place, tricycle, light twin. Most of these details are published with this article in the table of specifications and performance and in the drawings, all of which were furnished by Beech.

Performance figures announced by Beech are based on a gross weight of 5,095 lbs., described as being the "military gross load with one-half fuel load." Speeds are guaranteed within 3 per cent and climb, range, take-off and ceiling are guaranteed within 5 per cent "when demonstrated by Beech."

According to these figures, the Twin Bonanza is a 191-mph. airplane at 10,000 ft., and using 65 per cent of power. The only fuel consumption stated by Beech is 24.8 gals./hour at 60 per cent of power, although maximum range at 65 per cent of power and at 10,000 ft. is given as 935 miles and as 1,005 miles at 10,000 ft. while using 60 per cent of power. High speed at sea level is 200 mph., and maximum dive speed is 280 mph. IAS. Landing speed with full flaps is 59.2 mph., and stall speed with gear and flaps retracted is 73.1 mph.

The Twin Bonanza's rate of climb

First factory drawings of the Twin Bonanza to be released provide complete dimensions and plan-form of the new design. Cabin interior measures 11.5 ft. in length with widest interior point being 54 ins. (front seat). Specifications and performance are on opposite page.
—(Beechcraft Drawings.)

n Bonanza

details of its promising light twin

Latest flight picture of the light twin under development by Beech is this close-up which emphasizes cabin roominess and cleanness of nacelles housing 260-hp. Lycoming engines. Note exhaust augmentors, which are believed to provide auxiliary thrust as well as more efficient cooling. Partially exposed wheels absorb loads in emergency belly landings. —(Beechcraft Photo.)

at sea level is listed at 1,650 fpm. This drops to 322 fpm. for single-engine climb at sea level, but the single-engine rate is increased to 465 fpm. with full-feathering propellers. Take-off distance over a 50-ft. obstacle at sea level and with no wind is 1,050 ft., and landing distance over a 50-ft. obstacle at sea level and with no wind is 1,137 ft.

Two-engine service ceiling is 20,400 ft. With constant-speed propellers, single-engine service ceiling is 8,100 ft., but with full-feathering propellers this is 11,300 ft.

Specifications and performance data for the first time reveal the use of exhaust augmentor tubes with the Twin Bonanza's Lycoming Model GO-435-C2 geared, flat-six engines. This engine has a sea level maximum take-off rating of 260 hp. at 3,400 rpm., and a normal sea level rating of 240 hp. at 3,400 rpm. The exhaust augmentor tubes, as revealed in SOUTHERN FLIGHT earlier, promote efficient cooling without the use of cowl flaps. Exhaust pipes from each bank of 3 cylinders empty into an augmentor tube, as does cooling air taken in through the nose. Flowing rearward in a line as straight as possible, the air provides a ram effect inside the tube to augment the velocity of the exhaust gases. Thus a forced pumping of exhaust results, promoting more efficient cooling. Pilots who have flown the airplane with the tubes are said to have reported increased performance, as if from increased power from jet-effect. However, Beech has not revealed details of the augmentor tubes' effect on power.

Beechcraft constant-speed propellers, Model B 200-116, are used. These are of laminated wood, covered with plastic material as are the propellers widely used on single-engine Bonanzas. Full-feathering propellers for the Twin Bonanza are being developed, it is understood. The company does not mention this development, but its performance figures include variations in single-engine performance for full-feathering blades.

With an empty weight of 3,750 lbs., and a gross of 5,500 lbs., the Twin Bonanza has a useful load of 1,750 lbs. Empty weight includes complete flight and navigation instruments, complete two-way radio, marker beacon receiver, homing loop and fixed antenna; cabin heating and ventilating system with windshield defrosters; soundproofing; constant-speed propellers; landing lights and unusable fuel. Beech literature lists radio equipment as being VHF and including ADF and omni-range reception, with two cabin speakers.

The cabin's inside dimensions are 11.5 ft. for length and 54 ins. maximum width. The front seat is 54 ins. wide, rear seat is 52 ins. wide and fore and aft spacing of seats is 39 ins. For "relaxed" instrument flying, the instrument panel, except for gyro in-

(Continued on page 27)

Specifications and Performance

Six-place Model 50 Beechcraft Twin Bonanza, powered by two Lycoming GO-435-C2 engines rated 260 hp. @ 3,400 rpm. (sea level) for take-off and 240 hp. @ 3,000 rpm. normal, with Beechcraft constant-speed B 200-116 propellers.

Military Gross Weight (½ fuel), lbs.	**5,095**
Gross Weight, lbs.	**5,500**
Empty Weight, lbs.*	**3,750**
Useful Load, lbs.	**1,750**
Baggage max. allowable (260 lbs. rear, 300 lbs. forward), lbs.	**560**
Wing area, sq. ft.	**277.06**
Wing Loading, lbs./sq. ft.	**19.87**
Power Loading, lbs./hp.	**11.57**
Fuel Capacity, inboard wing tanks, gals.	**85**
Auxiliary Fuel Capacity, outboard wing tanks, gals.	**50**
Cruising Speed, 10,000 ft. @ 65% hp., mph.	**191**
Stall Speed, gear and flaps extended, mph.	**59.2**
Stall Speed, gear and flaps retracted, mph.	**73.1**
Take-off Distance over 50-ft. obstacle, ft.	**1,050**
Landing Distance (full flaps) over 50-ft. obstacle, ft.	**1,137**
Rate of Climb, two engines, sea level, fpm.	**1,650**
Rate of Climb, single engine, sea level, fpm.†	**322**
Service Ceiling, two engines, ft.	**20,400**
Service Ceiling single engine, ft.‡	**8,100**
Max. Range, 10,000 ft. @ 65% hp., miles	**935**
Max. Range, 10,000 ft. @ 60% hp., miles	**1,005**

NOTES: Performance figures are for military gross (½ fuel). Performance is for sea level, zero wind, gross weight, standard air unless otherwise noted. Performance guaranteed by Beech within 3% for speeds and within 5% for climb, range, take-off and ceiling when demonstrated by Beech. *Empty weight includes complete flight and navigation instruments; radio transmitter, receiver, marker beacon receiver, homing loop, fixed antenna; cabin heating and ventilating system with windshield defrosters; soundproofing; Beechcraft constant speed propellers; landing lights and unusable fuel. †For constant-speed propellers; rate of climb of 465 fpm. is specified with full-feathering propellers. ‡For constant-speed propellers; single-engine ceiling of 11,300 ft. is specified with full-feathering propellers.

Temco YT-35 Bu

THREE Temco YT-35 basic trainers delivered to the U. S. Air Force and currently being field-tested at both Randolph Field and Connally AF Base for evaluation are best described as having the looks of a Mustang, the tandem cockpit equipment and finishing of a T-6, the maneuverability of a miniature fighter and the safe handling characteristics and economy of a business man's personal airplane.

The design, known as the Buckaroo, was developed by Texas Engineering & Manufacturing Co., Inc., of Dallas from the commercial Swift, over a thousand of which have been sold on the market since World War II. The Buckaroo is heavier, has a 165-hp. Franklin engine, squarish wings and tail surfaces, almost exact copy of the T-6 cockpit, a redesigned tail and a

Squarish lines of Buckaroo show its fighter-like appearance in these climb and take-off views. YT-35 now has 165-hp. Franklin in nose.
—(Temco Photos.)

5 Buckaroo

heavy-duty 24-volt electrical system instead of the usual 12-volt system used in civilian lightplanes, this to power all of the extra electrical equipment required for military operations.

One version of the Buckaroo even has a .30-cal. machine gun mounted in each wing, with sight and camera guns, to carry out further the little 1,975-lb. trainer's close resemblance to a miniature fighter.

But the Temco YT-35 shows up most dramatically as a military performer in aerobatics, which have been widely demonstrated by Temco test pilots and others. Pictures on these pages showing the Buckaroo in action were made with a sequence camera. Temco says the trainer is stressed for an ultimate flight load factor of 9G and meets all CAA aerobatics category structural requirements. Accelerometers are installed on both front and rear instrument panels to keep instructor and student informed on G loads at all times.

Regarding aerobatics, Temco says "the Buckaroo is ideally suited for all types of aerobatics other than those involving sustained periods of inverted flight. Maneuvers can be performed with unbelievable precision due to the Buckaroo's aileron control.

"Recommended TIAS entry speeds for various maneuvers are as follows: Loop, 160 mph.; chandelle, 140 mph.; Immelman, 170 mph.; slow roll, 120 mph.; snap roll, 90 mph., and lazy eight, 130 mph.

"The Buckaroo gives plenty of warning in the form of tail buffeting before the stall is reached, even in steep turns, and breaks cleanly, both with and without flaps with no tendency to fall off on either wing. Due to its slotted wings, it provides full aileron control completely through the stall, and fully coordinated turns can be made at stalling speed.

"Spins can be accomplished at both forward and rear center of gravity. Recovery is precise and positive and can be accomplished in 1½ turns after a 5-turn spin in accordance with

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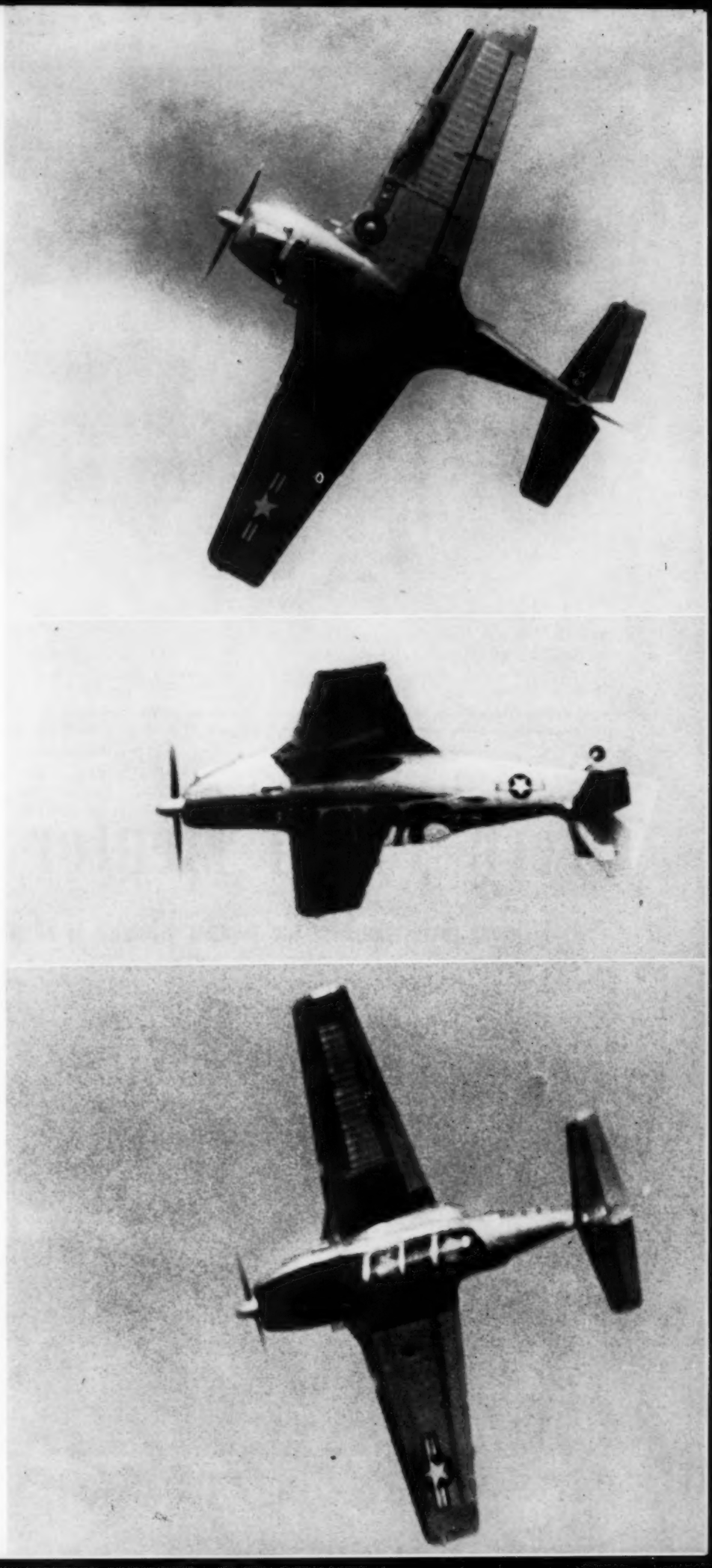


Sequence camera shots caught remarkable detail in these three aerobatic attitudes. —(Temco Photos.)

New Beech Mentor retains resemblance to familiar Bonanza, popular 4-place civilian type widely used for transportation. Tandem cockpit, conventional tail, more powerful engine and use of exhaust augmentors are chief modifications noticeable in photograph. —(Beechcraft Photo.)

Beech YT-34 Mentor

Efficient performance of the popular Bonanza is adapted to military trainer counterpart

A NEW concept in military basic trainer aircraft has been introduced with delivery to the U. S. Air Force of three Beechcraft YT-34's, with postwar engineering advances offering performance on the order of prewar trainers but with less than half the horsepower and consequently with greater economies in cost, operation and maintenance. Although it is much lighter than wartime trainers, it is stressed for an ultimate flight load factor of 10, which is above that for which old-type trainers of comparable performance were stressed, according to Beech.

This new tricycle Beech trainer with nose wheel went into USAF service tests carrying a CAA Approved Type Certificate under CAR Part 03—the first trainer of comparable performance to be so certificated and subsequently accepted by the Air Force. In the category under which it was approved, it is unrestricted for maneuvers.

The first three YT-34's were ordered by contract last March and were hand-built with facilities of the Beech experimental department. Their design is an outgrowth of the earlier "Mentor," itself developed from the company's postwar commercial Bonanza design. Beech capital covered all costs of design and development. While no production estimates have been mentioned, Beech officials say they can produce any required quantity of the multi-purpose trainer as rapidly as necessary components can be procured.

Economy Stressed

The company says the YT-34's performance pattern parallels that of the old 650-hp. T-6, but requires only one-third of that power. It estimates that each YT-34 would save 150,000 gallons of aviation fuel during a 5-year period over the T-6 with utilization of 5 hours daily, plus commensurate savings in engine maintenance of $9,750.

Evaluation tests with the pilot order of three YT-34's already delivered, and tests conducted with other postwar trainer designs, will determine future procurement of USAF and the Navy basic trainers. Results from these tests and a procurement decision were expected momentarily in late September following a speed-up in the trainer evaluation at Randolph Field.

The Beech trainer is powered by a newly-developed Continental 6-cylinder engine equipped with exhaust augmentor tubes and rated at 220 hp. for take-off, and is equipped with a newly-developed Beechcraft all-metal constant-speed propeller. Gross weight is

2,750 lbs. but performance figures released by Beech are for a "military" gross of 2,600 lbs. (normal gross minus one-half fuel load).

Wing area is 177.6 sq. ft., wing loading is 15.5 lbs./sq. ft. and power loading is 13.4 lbs./hp.

Beech performance figures include 167-mhp. cruising speed at 10,000 ft. and at 60% of rated power, at which fuel consumption is 10.8 gph. This provides a cruising range of 770 miles with 50 gallons of fuel. Design dive speed is 280 mph.

A 1,210-fpm. rate of climb from sea level is reported for it, with a 21,200-ft. service ceiling. Beech says it will take off over a 50-ft. obstacle at sea level in 918 ft., and land over a 50-ft. obstacle in 820 ft. Landing speed with full flaps is 54.3 mph.

Aerobatics

Unlike the commercial Bonanza from which the prototype was developed, the YT-34 incorporates a conventional tail instead of the Beech V tail. Maneuvers in it are described by Beech as follows:

"The YT-34 has a rapid rate of roll, requires little correction for adverse yaw. A single snap roll comes through at 120 mph. with lighter control pressures than most airplanes require. The favorite of most pilots, the slow, or aileron, roll can be accomplished at very low air speeds as well as with usual entry at near-cruising speed. In fact, it actually can be rolled inverted at 100 mph. indicated and then climbed 300 ft. before the stall. Normal slow rolls are easy on the arm and require a minimum of correction for directional control.

"Internationally known pilots, such as Betty Skelton and Bevo Howard, have flown the prototype on such occasions as the National Air Races, the All-American Air Maneuvers and the Chicago Air Fair. The full syllabus of aerobatics was flown by Mr. Howard at the last Miami air show. Both pilots have won international aerobatic championships in their categories on two or more occasions.

"The experimental pilots at Beech have found during several hundred hours of Mentor and YT-34 tests that flight characteristics are in keeping with the highest standards of military training requirements, while incorporating safe elements of stability. A high ultimate flight load factor of 10 makes this new trainer fully qualified for aerobatics, and is the highest load factor among today's trainers—considerably higher than the load factor of World War II trainers of comparable performance.

"Stall and spin performance is positive. Power-on stalls with gear and flaps extended comes at 50 mph. indicated, with noticeable tail buffeting effect. Spin recovery is by the standard NACA method, which takes less than a turn to accomplish."

The need for a new military trainer of advanced design has been acknowledged by military training authorities ever since 1945. At that time experiments were launched to study revisions to existing cadet training equipment and courses. Chief among these was the use of surplus T-6 trainers instead of prewar types such as the Boeing-Stearman biplane in primary flight training. Later, a production order was issued for new-design North American T-28 trainers with nose wheel landing gear. Development of a lighter trainer for both primary and basic flight training has been awaited.

"Delivery to the U. S. Air Force of our YT-34's vindicates our thinking of three years ago, when Beech Aircraft engineered a new concept in economical, high-performance military aircraft for pilot training," commented Walter H. Beech, the manufacturer. ★ ★ ★

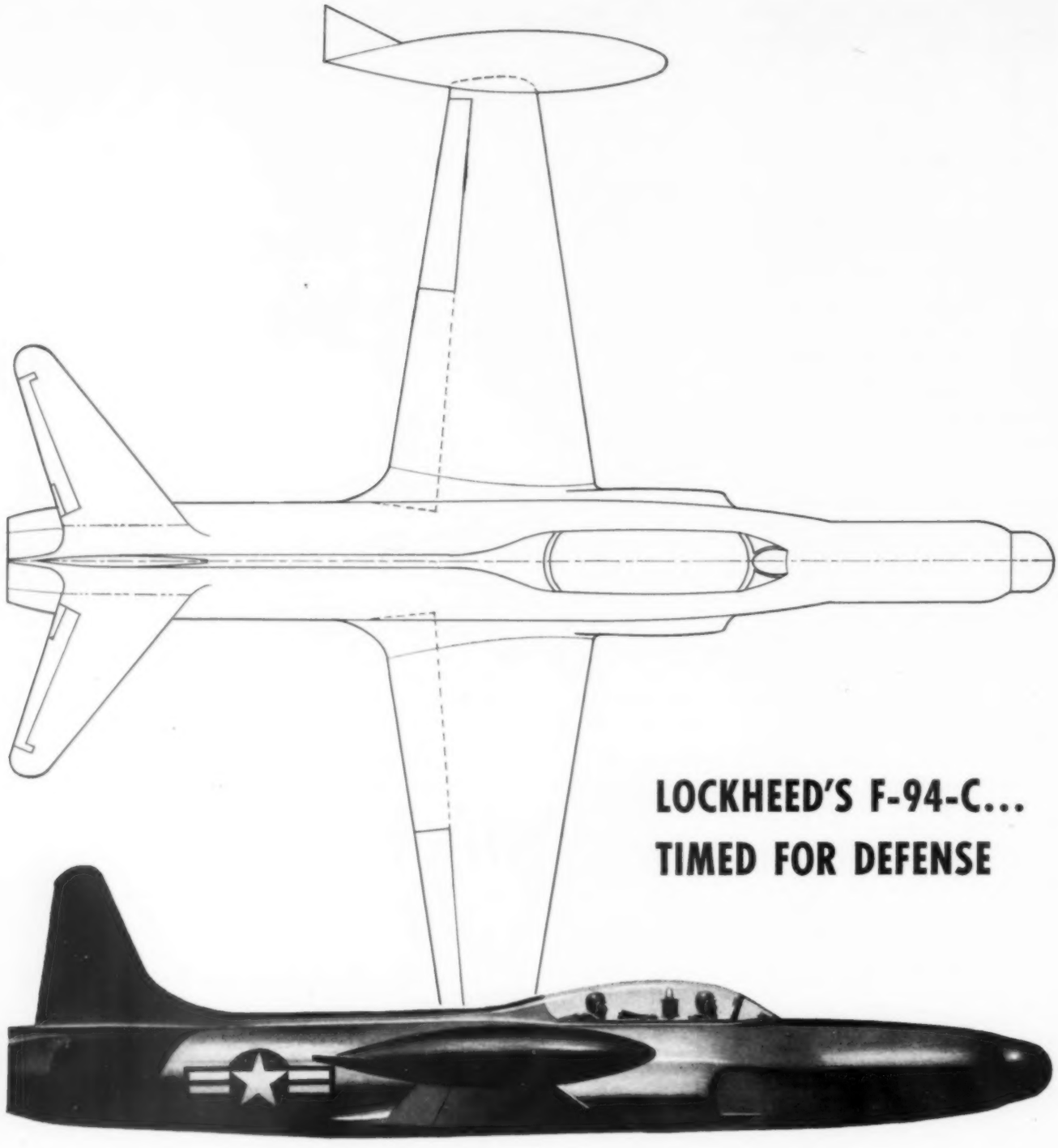
Beech YT-34

Performance with 2,600-lb. gross wt. (2,750 lbs. minus one-half fuel load). Continental E-225-8 engine (220 hp. for take-off). Beechcraft exhaust augmentors. Beechcraft Model 215-207 all-metal propeller.

Cruising Speed (10,000 ft. @ 60% hp.), mph.	**167**
Top Speed (sea level), mph.	**188**
Design Dive Speed, mph. IAS	**280**
Service Ceiling, ft.	**21,200**
Rate of Climb (first minute), fpm.	**1,210**
Range (10,000 ft. @ 60% hp., 50 gals.), miles	**770**
Fuel Consumption (60% hp.), gph.	**10.8**
Landing Speed (full flaps), mph.	**54.3**
Landing Distance over 50-ft. obstacle, ft.	**820**
Take-off Distance over 50-ft. obstacle, ft.	**918**
Span, ft./ins.	**32/10**
Length, ft./ins.	**25/10**
Height, ft./ins.	**9/7**
Wing Area, sq. ft.	**177.6**
Wing Loading, lbs./sq. ft.	**15.5**
Power Loading, lbs./hp.	**13.4**

Note: All performance for 2,600-lb. gross sea level, no wind unless otherwise noted.

Mentor is first lightweight military trainer with tricycle landing gear. It is powered by 220-hp. Continental engine and has 2,750-lb. gross weight. Three are being evaluated in USAF field tests. —(Beechcraft Photo.)



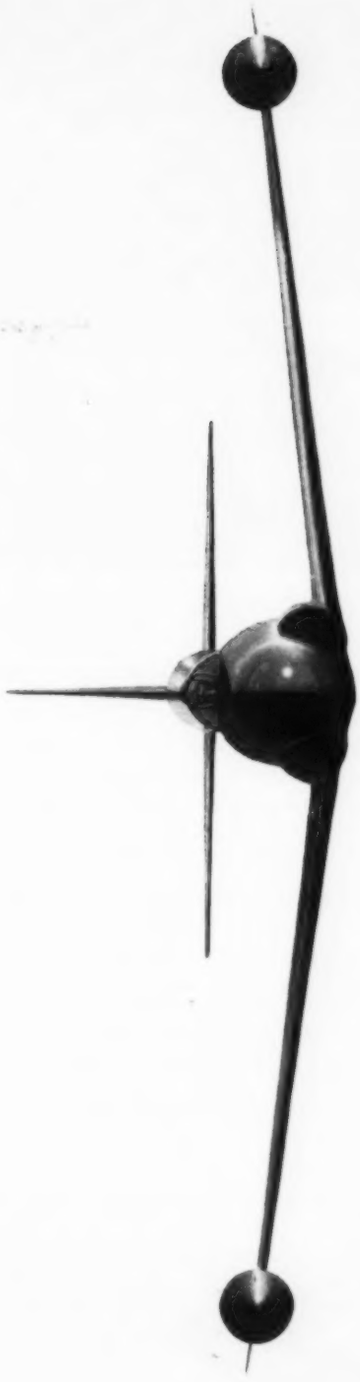
LOCKHEED'S F-94-C... TIMED FOR DEFENSE

LIKE MANY ANOTHER U. S. weapon for defense these days, the Air Force's new Lockheed jet fighter, the F-94-C, is too good to be talked about. You'll know this plane by the thrust of its speed, the sound of its power, and its purple-blue exhaust as it streaks through the night or through the roughest weather.

But beyond this physical impact of the new F-94-C thin-wing Jet, there is not much you can know about the airplane. It has more of everything—versatility, maneuverability, stability, etc. —but it's so good it's secret.

IT TOOK MORE TIME, more skill and more ingenuity to build the F-94-C than its distant World War II cousins. Good as they were, World War II airplanes were not the complicated package of speed, electronic intelligence and firepower found in the F-94-C. Nor did they require the years and years spent in the development of men, machines and materials now needed to build an airplane for defense.

It takes more and more time and planning to build an airplane, and the F-94-C was timed years ago—by Air Force and Lockheed engineers—for today's defense.



LOOK TO LOCKHEED
FOR LEADERSHIP IN JETS

LOCKHEED
AIRCRAFT CORP., BURBANK, CALIF.

TWIN BONANZA

(Continued from page 21)

struments, is tilted forward 10 degrees to be nearly perpendicular to the line of sight. Engine controls and instruments are grouped together. Tab and engine controls are placed in a small off-center panel which does not interfere with leg room. A throw-over control wheel is standard. To use it and engine and tab controls, the co-pilot, or "assistant pilot" as Beech calls him, will sit towards the middle of the seat. There is ample room on his right for a third person.

Plenty of Baggage Space

Two large baggage compartments have a total maximum baggage allowance of 560 lbs., of which 300 lbs. is for the nose (14 cu. ft.) and 260 lbs. for the rear compartment (41 cu. ft.). The rear baggage door is large enough so that when used for an ambulance plane, a stretcher patient may be loaded into the cabin through the baggage door without having to be lifted onto the wing and through the cabin door. Rear baggage door dimensions are 26.5 by 26.75 ins., and nose baggage door dimensions are 21.5 by 19.75 ins.

Fuel capacity consists of 85 gals. in main inboard wing tanks and 50 gals. in auxiliary outboard wing tanks. U. S. Rubber fuel cells are used. Fueling is done from the leading edge of the wing. The Lycoming engines have 12-qt. oil capacity each. In the nacelles, the entire engine is accessible for ordinary maintenance and inspection by a mechanic standing on the ground. Hinged cowl sections are opened by releasing only four simply-constructed fasteners, and the top cowling is readily removable for engine assembly removal.

Its tricycle gear features a swiveling, steerable nose wheel having a tire size of 6.50 by 10. Main wheels have tire size 8.50 by 10. Goodyear single-disc brakes and wheels are used. Main gear tread is 12 ft. 9 ins., and wheel base is 10 ft. 9 ins. Air-oil struts on all wheels are designed for shock loads by landing at a vertical rate of descent of over 600 fpm. An emergency landing gear extension handle is located between the pilot and co-pilot positions. Cabin warning lights and mechanical visual indicators are provided.

"Built-in engineered crash safety" is a feature of the Twin Bonanza's construction and outfitting described as follows: (1) The tires absorb energy in wheels-up landings; (2) only a negligible amount (4.5%) of the gross weight is in a position of hazard to cabin occupants in event of crash; (3) an extra-strong, energy-absorbing nose section with a baggage compartment serves as a shock absorber; (4) cabin structure is reinforced for passenger protection; (5) keels and floor sections are reinforced; and (6) over 62 per cent of the gross weight is located below or forward of the cabin, not on top of or behind the occupants.

Beech says the Twin Bonanza's structural and operational standards exceed government requirements. All the structure has been tested to an 8G flight load factor (equal to carrying a 19-ton bridge) to provide safety over and above required factors. Safety belt anchors are designed for 25G's and 25G safety belts or the 25G Beechcraft safety harness are available for all occupants. Airline safety belts are required to withstand only 6G.

About Deliveries

As for deliveries, Beech makes the following statement: "The Twin Bonanza has been the subject of considerable interest on the part of industrial, executive, and fleet aircraft owners who have been actively querying distributors as to delivery possibilities of this new model.

"Delivery of the first production units early next Spring is still Beechcraft's goal. And while the manufacturer is faced with the same critical material procurement uncertainties that now affect future delivery schedules of nearly all non-military business transportation equipment, the Beech management early in June instituted an acceleration-for-preparedness production program designed to provide for full continuation of its commercial aircraft sales and service activities concurrent with its rapidly expanding military production.

"If the cold and warm wars remain in their present state, it is likely that civilians will get a fair share of the production of this new Beechcraft. If a greater emergency develops, all of the production may be allocated to the armed services."

It has been learned by SOUTHERN FLIGHT that no definite price has yet been decided for the Model 50, although the factory estimated last February that the price would be about $30,000. No deposits are being accepted. It had not been licensed as of late September.

The Twin Bonanza was originally announced in July, 1949, as a roomy 5-pl. executive airplane capable of seating six persons for medium-range flights. It first flew on November 15, 1949. As of September 15, the prototype had been flown a total of 216

(Continued on page 36)

"Andy Gump" resemblance is shown by XC-120 in flight without its detachable cargo fuselage, which carries 10 tons of cargo. Pack Plane is powered by two 3,250-hp. Pratt & Whitneys. —(Fairchild Photo.)

Fairchild Pack Plane

ACTUAL flight tests are now supplementing engineering studies of the long-sought utilization of the truck-trailer principle for carry-all cargo aircraft. At Fairchild Aircraft in Maryland, the revolutionary XC-120 Pack Plane has made its initial flights, both with and without a detachable 2,700-cu. ft. cargo fuselage designed as a huge pod. Significant military trials scheduled for it will test a number of radical arrangements capable of influencing revolutionary changes in both military and commercial air lift development.

Evolved from C-82

Conceived by Armand J. Thieblot, Fairchild's 46-yr.-old French-born chief engineer, the XC-120 is a twin-boom aircraft powered by two 3,250-hp. Pratt & Whitney engines and was designed along the same basic arrangement of the familiar Fairchild C-82 and C-119 Flying Boxcars. Fully loaded and with cargo compartment attached, the airplane has a gross

Ground shots show radical transport's comparative size. Note quadricycle landing gear necessary to accommodate cargo pod handling. Only four bolts are used to connect pod to flat belly. —(Fairchild Photos.)

weight of about 64,000 lbs., of which 20,000 lbs. can be carried in the pod.

The plane itself—power plants, control cabin, booms and tail surfaces—serves as the truck tractor does in the hauling of cargo trailers, except that the C-120 tucks its "trailer" beneath its flat belly instead of towing it behind. The general idea is for the radical aircraft to be capable of flying into a field, have its "fuselage" unslung and rolled away, and be ready to depart in a matter of minutes either with or without a pod.

Quick Disconnect

Only four ball-socket connections hold the huge pod to the aircraft. For raising and lowering detachable fuselage, four electrical cable hoists are used, two on either side. Cables are attached to four points on the outside of the pod, and can be operated simultaneously or separately. When air is pumped into it, a rubber tubing fitted around the entire top edge of the pod tightly seals the joint between airplane and pod.

So that the unit can be rolled away from the mother plane, it has four small dual-wheeled dollies, two on either side. These wheels are removable for stowage in the fuselage for flight. The pod has both front and rear clam-shell doors for quick, direct loading and unloading.

To accommodate the pod, a "quadricycle" landing gear was devised for the aircraft, consisting of four dual-wheeled main gears, two on each side, which retract into the nacelles.

A wide range of cargo loads and pod arrangements is covered by Fairchild experimental plans which are to be studied. These include built-in units such as complete mobile hospitals, machine shops, control towers, communications centers, offices and fuel tanks, which could be used for storage after detached from the airplane.

'Chute Drops Planned

Then Fairchild will experiment with droppable pods which will be landed by parachute. Six-ton howitzers already are being parachuted from C-119's, but the loaded pods would weigh 10 tons or more. These drop units would include landing barges filled with equipment for beachhead operations, theater signal units fully equipped for operation in inaccessible places and droppable shelters for Arctic rescue work and complete with food, medicine, heaters, radio and the like. Dropped by air, they would eliminate the need for landing the big carry-all aircraft. Already, Fairchild has several modifications of the basic design to fit various logistics problems. ★ ★ ★

Long-range Boeings at Temco for plush interiors.
—(Temco Photos.)

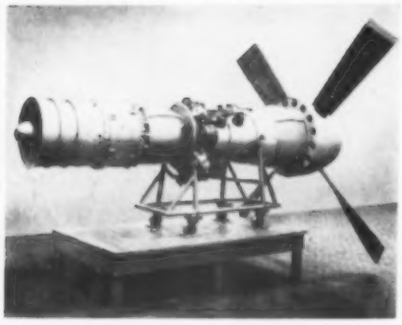
Flying HQ Offices for USAF Brass

LONG-RANGE air power has resulted in the need for "command transports" for the U. S. Air Force's globe-girdling Strategic Air Command. The first three such mobile advance base headquarters airplanes have been delivered by Temco in Dallas, which installed interior accommodations. They are modified Boeing VC-97D Stratofreighters, their double-deck interiors completely equipped with office and living facilities for staff personnel accompanying overseas missions. In each ship, staff personnel can live for a week or more. A galley can prepare and serve 130 hot meals a day. An auxiliary power plant allows normal use of lights, radio, galley and heating equipment on the ground. Seats for 48 persons and 40 berths for sleeping are provided. ★ ★ ★

Offices, conference rooms have phones, desks and clerks.

Galley can prepare and serve 130 meals daily aboard ship.

WAC shows folding berth (below). Stair connects decks.



MOST POWERFUL TURBO-PROP engine now flying is Pratt & Whitney T-34 Turbo-Wasp of 5,000 to 6,000-hp. It uses a 13-stage axial-flow compressor with annular type burner and 3-stage axial-flow turbine. Flying in nose of B-17, it has a fuel consumption of .62 lbs./hp./hr. Gear reduction is at 11 to 1 ratio. Basic weight is 2,550 lbs.
—(Pratt & Whitney Photo.)

AIR REPORT

(Continued from page 7)

an average of 5 commercial airplanes daily. It is also tooling up for a huge multi-million-dollar contract from Boeing for B-47 jet bomber components and other military orders, and is well under way with construction of an additional new factory building.

NO FURTHER ERCOUPE PRODUCTION FOR MANY MONTHS, says Sanders Aviation, Inc. — due to military situation and backlog of other orders now held by Engineering and Research Corp., manufacturers. They have removed the Ercoupe assembly line to make room for military work and it does not appear probable that aircraft production can be resumed next Fall. All 1950 Model G's have been sold. Two 1949 Model G's and three Model E's are on hand. Sanders Aviation will continue supplying spare parts through distributor-dealers.

NORTH AMERICAN AVIATION WILL TAKE OVER OHIO AIRCRAFT FACTORY FORMERLY OPERATED BY CURTISS-WRIGHT AT COLUMBUS to meet production requirements which already exceed Los Angeles facilities of the company. Type of planes to be produced was not disclosed. Current production models of NAA are AJ-1 Navy bomber, F-86 Sabre fighter, B-45 4-jet bomber and T-28 trainer. . . . **VOLUNTARY DISCONTINUANCE OF AIRFRAME MANUFACTURE AT COLUMBUS** has been announced by Curtiss-Wright, which is withdrawing from the airframe business to concentrate on power plants, propellers and flight simulators at Wood-Ridge and Caldwell, N. J. C-W has appointed Charles W. Frick, formerly with Ford Motor Co., and Kaiser-Frazer, as works manager for the Propeller Division.

THE ANDERSON-GREENWOOD AG-14, two-place pusher powered by a Continental 90 hp. engine was granted approved type certificate by the CAA last month following more than three years of little publicized effort by Houston, Texas, engineers Marvin Greenwood, Ben Anderson and Lomis Slaughter, Jr., who formed the Anderson Greenwood & Company in 1947 after five years of wartime work in the engineering department of Boeing, Seattle. Although unsettled market conditions, due to the international situation, may prohibit any sizable production program, AG-14 backers say it can be built and sold profitably for around $4,200 barring further price increases. The all-metal, tricycle pusher with steerable nose wheel carries its tail on twin booms attached to the wing center section. With a Hartzell wood prop, which provides a climb of 715 fpm., the novel plane cruises at 112 mph. at 2,350 rpm. (75% power). The long, narrow wing, with 7 degrees of dihedral, has less wing area than the Temco Swift. Landing speed is around 53 mph. Cabin roominess and comfort, low noise level and remarkable forward vision are the outstanding features of the new design (complete flight story in next month's November issue).

A QUEEN AND A PRINCESS were among attendants at the National Flying Farmers convention last month at Bemidji, Minn. The queen is shown above receiving a $100 bill from R. E. (Dutch) Dutton of Cessna Aircraft, which sponsored the contest. She is Miss Jean Wright of Roll, Arizona. The princess is shown below, being Princess Ione, Chipewyan beauty of Bemidji. She's shown with Arthur Hoffman, Rochester (Minn.) Beech distributor.
—(Top Photo by Cessna; Bottom by Beech.)

PACER AMBULANCE CONVERSION is possible in a jiffy with lightweight Storm Lake litter. It is loaded through left rear door, with foot resting on right front seat (back removed) and head on back of rear seat. Only special equipment is two clamp-on fittings for tie-down straps. Litter can be made up into many different shapes; is stowed as baggage when taken apart.
—(Piper Photo.)

Barring unforeseen protests, the **FEDERAL COMMUNICATIONS COMMISSION WILL ALLOCATE THE 122.8 FREQUENCY TO CIVIL AIRMEN AS A VIRTUAL "PARTY LINE" FREQUENCY,** which will permit plane-to-plane and plane-to-ground radio communication, long sought by airmen, especially those in remote areas where Federal facilities are sparse. Allocation is expected before January 1.

CAA ADMINISTRATOR DEL RENTZEL HAS BEEN APPOINTED CHAIRMAN OF THE CIVIL AERONAUTICS BOARD by President Truman to fill the long-vacant chair of former Chairman Joseph J. O'Connell, Jr. Donald W. Nyrop, 38-year-old deputy Administrator, has been moved up to Rentzel's CAA post. Rentzel's appointment to the Board might foreshadow ultimate recreation of an agency similar to the old Civil Aeronautics Authority under the Department of Commerce, some observers believe. Such a move would destroy independent status of CAB and probably make the assistant secretary of commerce for air the most powerful civil air post in government. A grass-roots movement is now on foot to encourage the appointment of an active pilot as Nyrop s deputy. Nyrop, who started his government career with the old Civil Aeronautics Authority in 1939 and served with the Air Transport Command as a lieutenant colonel during the war, is not a pilot.

CAP URGENTLY NEEDS MORE CIVILIAN PLANE OWNERS AND PILOTS for its USAF-sponsored air search and rescue operations, for which owners and pilots can sign up without taking part in other CAP activities. Col. E. J. Reeves, Texas

How much did

MAINTENANCE

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One glance at your expense ledgers will tell you if your maintenance costs are above average. This cost may be due to many reasons, but the engineering staff of the J. D. REED COMPANY has reduced many aircraft maintenance accounts by a revolutionary PREVENTIVE MAINTENANCE PROGRAM. This program seeks out minor troubles before they develop into major repairs, thereby reducing the overall maintenance costs year in and year out.

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Wing Commander, issued an appeal for cooperation and new members to all Texas fixed-base operators. A two-day practice air search maneuver will be conducted Nov. 4-5 at Connally Air Force Base, Waco, in cooperation with the UASF Air Rescue Service. CAP members taking part in this and other official air searches for missing aircraft or persons are furnished free gas and oil by USAF. Owners and pilots desiring to assist in this worthwhile project are urged to contact Reeves at the following mailing address: Texas Civil Air Patrol Headquarters, Building No. 1037, Hensley Air Force Base, Dallas, Texas.

Ten of these DC-3 Starliners form Trans-Texas fleet.

Off to a Good Start

TRANS-TEXAS Airways marked its third anniversary on October 11. Three years ago it operated two airplanes, one between Houston and San Antonio and the other between Houston and San Angelo, carrying 402 passengers during its first month of operation. Today it operates a fleet of 10 DC-3 Starliners serving 38 cities, all in Texas, making it the nation's largest airline operating exclusively within a single state's boundaries. Compared with its first month's business of 402 passengers in 1947, it carried 6,380 passengers during the month of August, 1950, when its passenger-miles reached a new record of 1,447,917 passenger-miles in one month. In addition, air freight in August totaled 37,375 lbs.

This rapid growth has not been without serious problems. Many of them have been solved and the solution has been impressive to observers. Others remain as a challenge to the expanding feeder airline's management and the Civil Aeronautics Board.

As with most new feeder airlines, a three-year experimental operating period is insufficient to provide accurate conclusions on such matters as traffic potential, the full usefulness of mail and cargo service to cities and towns served, and the balancing of all cost details into a cut-and-dried efficiency pattern. This is especially true when the experimental airline covers the distances involved in Trans-Texas' routes, the large number of cities and towns served and the relatively short hauls between them. Only by acquiring operating experience can the pattern be improved, and this experience is now being gathered for the first time on a full scale with opportunity to effect significant improvements in scheduling, sales promotion and operating procedures.

Such problems are being ironed out by a staff headed by R. E. McKaughan of Houston, who at 40 has 23 years in aviation behind him. He began ground and flight training in 1928 with Curtiss-Wright. Before the war, his company conducted CPT flight training and after Pearl Harbor, McKaughan's new firm, Aviation Enterprises, Ltd., operated contract flight training schools at Houston and Sweetwater, Texas, training 1,800 pilots for the Air Force. He also operated one of the first civilian contract repair stations exclusively for the repair and overhaul of Air Force Aircraft.

Applying after the war for an airline authorization, McKaughan obtained a CAB certificate of public convenience and necessity for Trans-Texas Airways in June, 1947, launching passenger, mail and cargo service the following October. Financing, equipment, maintenance, scheduling, communications, sales and manifold other problems attendant to any new airline's inauguration provided obstacles for many months. But as each new step forward was accomplished, Trans-Texas began making improvements and experimenting with innovations. Now they're beginning to pay off, with resultant increases in passenger, air freight, air mail and air parcel post patronage. On a single day last month, 459 passengers flew on Trans-Texas—more than were carried during the entire month of October or November, 1947. ★ ★ ★

FORD MOTOR CO. WILL BUILD 3,500-HP. PRATT & WHITNEY ENGINES in Chicago on USAF contract, employing up to 25,000 workers on the project. . . . **JACOBS ENGINE COMPANY** has been re-acquired by Republic Industries, Inc., a subsidiary of Barium Steel Corp. Al Jacobs remains with the firm.

TEMCO AND CHANCE VOUGHT have received large contracts for Lockheed P2V component manufacturing in Dallas. Both had already received large component orders from Boeing for the B-47 jet bomber. Chance Vought is in production on the F4U-5 Corsair night fighter and last month received an order for development and production of an advanced version of the radical F7U Cutlass. In the latest of several Cutlass flight-test accidents, Engineering Test Pilot Pat Harrington lost his life when his experimental airplane overshot a runway and sank in a lake adjoining the factory.

ASSIGNMENTS IN PACIFIC AREA are open for civilian electronics and communications engineers, who are needed by Airways and Communications Service of the Military Air Transport Service. Interested engineers, who will fill positions in grades 7 through 12, should apply by writing: The Commanding General, Headquarters, AACS; Washington 25, D. C.; Attention Director of Personnel.

"ARMY AVIATOR" IS NEW GROUND FORCES RATING and replaces "liaison" rating formerly used. Army aviator training and operations will include instrument flight as a feature of expanding use of aviation. . . . **LARGEST MILITARY HELICOPTER ORDER** has gone to Bell Aircraft, which will deliver them to Army Ground Forces. . . . **HILLER'S FIRST MILITARY HELICOPTER** has been delivered and **KAMAN AIRCRAFT** has received a military order for helicopters. . . . **BAZOOKAS FIRED FROM LIAISON PLANES** have stimulated Army Ground Forces' interest in mounting weapons on the defenseless craft—to take pot shots at enemy forces including tanks. First lightplane to mount fixed machine guns in wings is Temco Buckaroo trainer. Two .30's were installed for recent firing tests.

LONGEST STATE AIR TOUR EVER FLOWN will be the second annual All-Texas Air Tour Oct. 21-28—a 3,400-mile trek visiting 55 cities, with over 150 airplanes participating. Texas Aeronautics Commission is sponsor, assisted by Texas Flying Farmers, TPFA and TSAA, with takeoff from Temple, Texas. . . . **NATA'S 11TH ANNUAL CONVENTION** will be held Nov. 1-3 in St. Louis at the Chase Hotel, according to C. A. Parker, executive director. . . . **"CIVILIAN AIRMAN TRAINING ACT OF 1950"**

is the title of a bill introduced in Congress by Senator Edwin C. Johnson, with a request for an appropriation of $150,000,000 to finance it. . . . **NATIONAL AIR TAXI CONFERENCE** has adopted dues, a working budget, an emblem for members offering national air taxi service, and advertising literature. The latter is being presented to the Conference through the efforts of the AIA's Personal Aircraft Council with the following companies contributing: Beech, Cessna, Piper, Ryan and Continental Motors. President Joseph Garside conducted the latest meeting in Washington on Sept. 28, with seventeen members present.

NEW BENDIX MN-97 OMNI-MAG. used with Bendix NA-3 omni, provides in one instrument the following facilities and functions: (1) bearing selection, (2) to-from indication, (3) left-right or localizer indication, (4) glide slope indication, (5) heading of aircraft in relation to selected omni or localizer bearing, (6) flag alarm for omni, localizer or glide slope receiver. Widely-known J. Walton (Sheriff) Colvin, Bendix personal aviation sales coordinator for several years, is now merchandising manager of the firm's mobile radio sales section. R. L. (Bob) Daniel is handling personal aviation radio sales. . . . **R. C. OWENS IS NEW AIRPORT MANAGER** of Jefferson County Airport, near Beaumont, Texas, formerly managed by the late Wayne Parks. Owens was United Air Lines personnel director in Chicago. . . . **SCORES OF FLYING FARMERS** were to gather in El Paso on Oct. 2 for an "on-to-California" air tour lasting until Oct. 6. . . . **NEW FISHING-HUNTING FLIGHT STRIP** has been opened to the public on Caddo Lake near Karnack, Texas, by Beer Smith of Marshall. Camps with lodging, food and boats are adjacent to the strip, dedicated by 400 persons who flew 200 planes in for the party.

RESEARCH CROP PLANE at Texas A. & M. College is shown in this latest photo almost ready for initial flights. Note flippers, height of vertical fin and cockpit, wide Cessna-type landing gear, thickness of low wing.

CAA CERTIFICATION OF ANDERSON-GREENWOOD MODEL 14 PUSHER in Houston was climaxed by presentation of ATC No. 4A1 to Marvin Greenwood (center, in dark suit). L. C. Elliott, 4th Region CAA Administrator, flanked by CAA staffers and Fred Weick (standing, left, in shirt sleeves) and members of his Texas A. & M. staff, made presentation when 90-hp., tricycle AG-14 visited Texas Aggie campus.
—(Texas A. & M. College Photo.)

Feeder Airline Facts and Figures

ONLY ONE-TENTH OF ALL INDIVIDUALS WHO FLEW AIRLINES LAST YEAR ACCOUNTED FOR OVER HALF OF ALL AIR TRAVEL. So reports Douglas Aircraft in announcing results of a nationwide survey of travel habits, opinions and attitudes. Other findings: Only one-half the nation's adult population got as far as 200 miles from home last year, despite network of highways, airways and railways. Only one quarter of the U. S. adults have ever traveled by air.

HELICOPTERS HAVE ALMOST DOUBLED THE USE OF AIR MAIL in the Chicago area served by Helicopter Air Service, Inc., which operates 1,200 miles daily serving 55 nearby communities. One route, Midway Airport to the general post office, is flown 18 times daily, covering a round trip of 18 miles. Bell helicopters are used, covering 280,430 miles with 2,190,790 lbs. of mail carried during their first year of operation. . . . **CAB HAS GRANTED 5-YR. EXTENSION** to Pioneer Air Lines, first of the feeders, which has completed its 100,000,000th passenger mile. . . . **MID-WEST AIRLINES' FIRST MILLION MILES** brought a placque for the accomplishment from Cessna Aircraft Co. The single-engine feeder uses Cessna 190 aircraft and on Oct. 3 inaugurated service to Columbus, Neb., its 28th city to be serviced on 1,257 route miles with over 5,000 miles now being flown daily in the 4-state area. . . . **TEN-FOLD GAIN IN PASSENGERS CARRIED** during its first year of operation was reported by Central Airlines. President Keith Kahle said 1,138 passengers were carried in the line's single-engine Bonanzas during August, and Bob Harding, vice president, reported the Beechcrafts have now flown a total of over 1,750,000 miles with a completion factor of 99 per cent for the last three months. Central makes 125 airline connections at its terminal cities. . . . **ANOTHER RECORD MONTH FOR BONANZA AIR LINES** was August, with 2,000 passengers, over 5,000 lbs. of air mail and 2,500 lbs. of air express and 10,000 lbs. of air freight carried, reports E. C. Converse, president of the Nevada-Arizona feeder. . . . **LAKE CENTRAL AIRLINES** is the new name for Turner Airlines, of which Mel Anderson is the new vice president-traffic and sales. He formerly was sales manager for Trans-Texas. . . . **FIRST PROFITS FOR ALL AMERICAN AIRWAYS** have been reported for August by Robert M. Love, president, with the month's business including 19,596 passengers. . . . **EXPANDED SERVICE SCHEDULES BY WIGGINS AIRWAYS** were announced by Joseph Garside, president, on its first anniversary. Boston and Albany now have 18 and 14 daily Wiggins flights, respectively, connecting with some 20 New England cities. . . . **"COST STANDARDS — DOMESTIC SCHEDULED AIR CARRIERS"** is the title of a study report just issued by CAB and prepared by Frank H. Crozier, special advisor to the Board. Standards presented are primarily for use in estimating probable financial effect of proposed route pattern changes.

DESIGN CONCEPT OF A RADICAL 24-PASSENGER TRANSPORT has been issued by Pardel Development Corp., 221 Park Ave., New York, featuring the Duo-Mono high-lift biplane configuration. Proposed data and performance goals include: Empty weight, 9,840 lbs.; gross weight, 19,540 lbs.; engines, two 800-hp. Cyclones; cruising speed at 60 per cent hp. at 5,500 ft., 202 mph.; sea level rate of climb, 1,615 fpm.; take-off distance over 50-ft. obstacle, 1,023 ft.; range, 800 miles. With two 1,100-hp. Cyclones, 60 per cent cruise would be 228 mph. at 5,500 ft., and take-off distance over 50-ft. obstacle would be only 746 ft.

Questions and Answers For Airport Operators

Air Fair Formula

QUESTION: In an effort to get more people acquainted with aviation and our airport, we plan to put on a show this Fall. Have you any suggestions to offer?

ANSWER: Yes. We suggest you get a copy of "The Air Fair," a booklet prepared by the Civil Aeronautics Administration and issued under a May, 1950, dateline. It covers the planning and operation of air shows and like events and you will find the suggestions contained in it pertinent and up-to-date. Copies may be obtained by mailing twenty cents to the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Keeping Hangar Floors Swept

QUESTION: We've been trying for three years to operate the cleanest hangar in the state. We've taken every piece of advice you have offered in your columns and we have tried doing all the things that anyone has suggested to keep up a high standard of cleanliness, safety and orderliness, but the floor has got us stumped. It is pretty dusty out here and no matter how much we sweep, it seems there is dust always buried in the concrete and sweeping doesn't get it out but the minute we put the broom away the dust just seems to come out where everybody can see it and smell it. Is there anything we can do to it?

ANSWER: We think that we can take it for granted that there is no way in which a hangar can be kept sealed up to prevent wind and dust from blowing in. If a floor is rough textured, it seems to catch every grain of dust in the county and if oil and grease spots are present, it does make for an unsightly floor that offsets all the care we can give a hangar. The cleanest hangar floors we have seen have been painted floors.

We saw one at Lordsburg, New Mexico, a year or so ago. It looked good enough for you to spread a picnic cloth and set out your lunch. These floors appear to be fairly smooth in texture and after they were painted did not catch and hold the dust. When oil pans are used and any spilled lubricants washed off at once they appear to make the best appearance. Some dust will blow into any hangar but a painted floor seems to be easier swept since the dirt and dust does not enter into the texture of the floor. We'd recommend that you consult your local paint dealer to find out what he can recommend in the way of a tough, wear-resistant paint for your floor. If you have any doubts about it or about the value of painting the floor at all, try out the paint on a fair-sized patch of floor where it will get plenty of wear and dust. I understand the hangar at Ponca City, Oklahoma, is also a very fine example. I have heard that they wax these floors and it is not very expensive. I will try to get some first-hand information and let you know.

House Lots Vs. Airports

QUESTION: I read your Question and Answer in the July issue which dealt with the problem of an owner of a private airport serving people who lived in a big town. What about the private airport operator in the little town where there is no publicly-owned airport? I'm in that position and I'm having a tough struggle to get along. There is enough business here to keep me going and I own the land I use but houses are going up near the airport and in time this airport of

(Continued on page 42)

MORE AND MORE TEXANS ARE FLYING TRANS-TEXAS *Starliners* WITH ME!

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There's no mistaking the increase in number of passengers and volume of freight along the "Route of the Starliners." The Starliners now serve over thirty-five Texas cities, including Pecos, Corpus Christi, and the Valley. That makes Trans-Texas the biggest airline operating exclusively in the biggest state.

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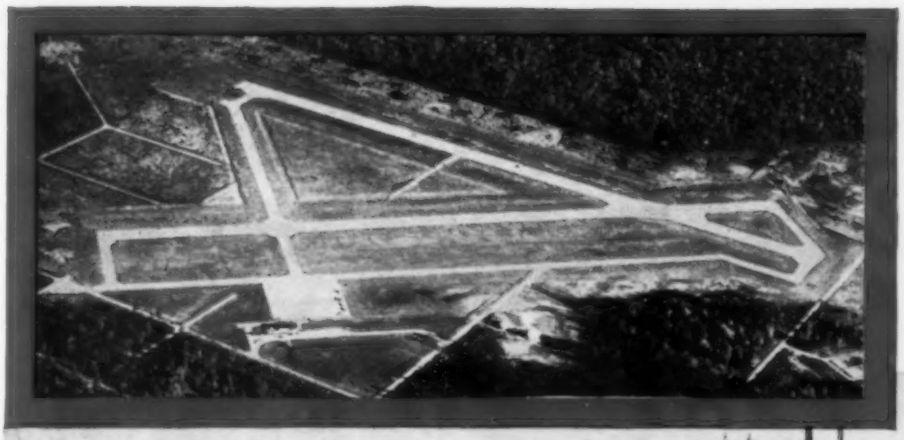

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Eugene C. Marlin, Manager

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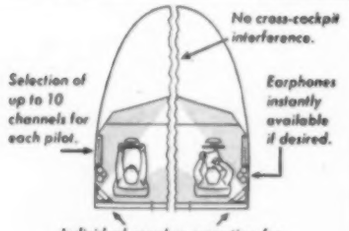
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Airmen's Calendar

Oct. 12-13 — 1950 Conference on Airport Management and Operations, sponsored by SOUTHERN FLIGHT, University of Oklahoma and 4th Region CAA, Norman, Oklahoma.

Oct. 21-28 — All-Texas Air Tour Week with 3,400-mile Air Tour of 55 cities, sponsored by Texas Aeronautics Commission with Texas Flying Farmers, Texas Private Fliers Association, Texas State Aviation Association; starting from Temple.

Oct. 22—Second Annual Aircraft Efficiency Race with Chuck Wagon Breakfast, sponsored by Colorado Springs Jaycees, Colorado Springs, Colo.

Oct. 25-26—Annual Flight Safety Foundation Seminar, Denver.

Oct. 26-27—Tennessee Aviation Conference, University of Tennessee, Knoxville, Tenn.

Oct. 26-27—Fifth Annual Arizona Aviation Conference, sponsored by Chamber of Commerce, Tucson, Ariz.

Nov. 1—Soil Conservation Demonstrations with Aircraft, sponsored by Texas Aeronautics Commission, Lockhart, Texas, Airport.

Nov. 1-3—11th Annual NATA Convention, Hotel Chase, St. Louis.

Nov. 7-17—Florida-Mexico City Air Tour; Registration by Arthur Stone, Craig Field, Jacksonville, Fla.

Nov. 29-Dec. 1 — ADMA Annual Meeting, Ambassador Hotel, Los Angeles, Calif.

Nov. 30—Airport Fire Safety Clinic, sponsored by National Fire Protection Association, Committee on Aviation and Airport Fire Protection, Baker Hotel, Dallas, Texas.

TWIN BONANZA

(Continued from page 27)

hours in service-test flights as part of an extensive laboratory, field and flight engineering test program to substantiate structural and operational capabilities. During this time, military interest was expressed by the U. S. Army Ground Forces and in mid-September, Beech sent the prototype to Washington, D. C., for military demonstrations there and at other Ground Forces, Air Force and Navy bases. With the prototype was a Beech crew consisting of Lynn D. Richardson, military sales division manager and Washington representative; Ralph Harmon, staff engineer; Claude Palmer, demonstration pilot, and Carl Thomas, technician.

Military utilization of the Twin Bonanza design is stressed in Beech literature which was carried with the prototype. Typical statements along this line include the following: "This airplane embodies the structural ruggedness of a military trainer combined with high performance, maximum economy and high utility. The Twin Bonanza can be easily modified as a twin-engine trainer, photographic, ambulance and cargo airplane." ★ ★ ★

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Continental Motors Corporation

AIRCRAFT ENGINE DIVISION
MUSKEGON, MICHIGAN

TURBO-PROP LUSCOMBE

(Continued from page 18)

liaison airplane's very high performance in take-off and climb. Level flight speed is not a factor in the Luscombe design study, for it would require a new airframe design taking full advantage of the Boeing turbine's light weight and small dimensions. Such a design would offer very high speeds and more favorable fuel economy. But use of an existing liaison design was the problem and it has been satisfactorily solved and economically, as far as take-off and climb are concerned.

With turbine advantages, the Luscombe liaison could operate out of smallest possible and in many cases unprepared air strips, especially at altitude in mountains. Taking off over a 50-ft. obstacle in only 244 ft. solves untold problems for military units in the field. That figure is for performance without benefit of wind. Luscombe says that the T-8G-L will get off the ground in only 56 ft. with a 23-mph. wind. Invasion craft could launch such liaison airplanes with ease. When the ship's speed plus that of the wind is considered, the T-G8-L with floats even offers gunnery spotting and radar defense advantages to such craft as merchant ships, cruisers and battleships.

This idea of using lightplanes with floats on the high seas originated in the operating experience acquired by commercial tuna fleets off the West Coast of California and Mexico. At least nine float-Luscombes are so used —they spot schools of fish, reducing time and money lost in "searching" for the catch. Sometimes the seas are rough—the Luscombes many times have taken off on patrol and landed in troughs between 20-ft. waves, their pilots developing cross-wind float technique to a fine art. To take the pounding, the Luscombes were beefed at all joints in a cooperative modification with the factory following suggestions from the fishing fleets, which take the little floatplanes to sea with them as vital equipment in the tuna gear. They are hoisted aboardship when not flying. Other lightplanes had been tried but couldn't take the pounding, even with beefed joints. This utilization of floatplanes is one of the most colorful but unheralded of all modern-day use of light aircraft by American business and industry.

Power Plant Details

Installation of the Boeing turbine in the liaison version of the Luscombe represents an interesting modification. The engine is installed backwards, with the compressor at the firewall and the propeller mounted on the opposite end. Only one air intake scoop is used and it is a small one of only 18 sq. ins. mounted on the left at the firewall. Luscombe engineers point out that the little turbine could actually operate effectively without the outside air scoop — sufficient air could be drawn in through the cockpit to meet requirements.

At the nose, the familiar cooling air intakes are gone. The turbine's cowl is a tight little package. A small cooling air hole may have to be provided as operating experience is acquired. Dimensions of the turbine engine itself are 22, 19¼ and 43½ inches.

The engine consists of two sections, a gas producer and a power output section. The gas producer incorporates a centrifugal, single-entry compressor coupled to a single stage turbine, two combustion chambers of the through-

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flow type, and an accessory drive section. The power output section incorporates a second turbine, reduction gears and output shaft. It is joined to the gas producer by a shroud. There is no connection between the two sections other than the shroud, which confines the flow of gases, and the engine frame which mechanically positions the two units.

Thus the Boeing arrangement permits the gas producer speed to be controlled independently of the output shaft speed, resulting in the equivalent of an engine with infinitely variable transmission.

The Luscombe design study utilizes a fixed-pitch metal McCauley propeller for the turbine engine. Plans call for a constant propeller speed of 2,600 rpm., regardless of power output in the turbine. The engine is rated at maximum power at 36,000 rpm. for the compressor. This is stepped down through the variable transmission and reduction gears.

Fuel is supplied to each of the two burners under pressure from an engine-driven fuel pump, fuel pressure varying from 30 lbs. per sq. in. at idle to 375 lbs. per sq. in. at rated speed. Amount of fuel supplied to the burners is controlled by a governor in the fuel system which is integral with the fuel pump. A second governor, driven by the power section, can be added. A fuel booster pump is provided to raise fuel pressure during starting. No priming is necessary.

The ignition system consists of a single ignition coil and one ignition plug with high tension wiring for each burner. Operation is required only during starting, after which combustion is continuous.

The complete oil system is integral with the engine except for the oil cooler and filter. The oil sump is part of the gas producer and has 4-qt. capacity. Oil pressure is 50-60 psi.

Maximum exhaust temperature in the exhaust diffuser does not exceed 1,300 degrees F. Maximum bearing temperature is 350 degrees F.

In starting the Boeing turbine, the

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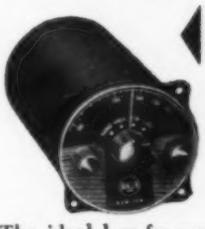

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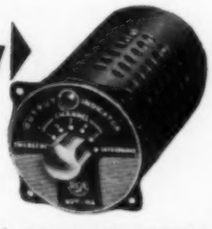

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OUR SPERRY FACTORY TRAINING was finished this Summer, and we really worked at Sperry's New Hyde Park, Long Island, school to get our diploma (we were the only commercial operators in a class of Sperry field representatives). But it was worth it — we learned the a-b-c's from the craftsmen who perfected the Zero Reader; we experimented with laboratory models and mock-ups; we had to pass trouble-shooting assignments; we were carefully checked out on proper operation of the ZR in flight as well as in the shop.

PILOTS WANT THE ANSWERS to installation and servicing details on the Zero Reader—as usual, we're first with the training, experience and judgment to serve their needs.

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generator motor is used to spin the compressor. There is no cranking and no compression as on a conventional piston engine. The weight of a conventional starter is eliminated. With the booster pump, fuel pressure is brought up to 50 psi. before the fuel valve is opened. Ignition starting is obtained after the compressor is turned up to about 5,000 rpm.

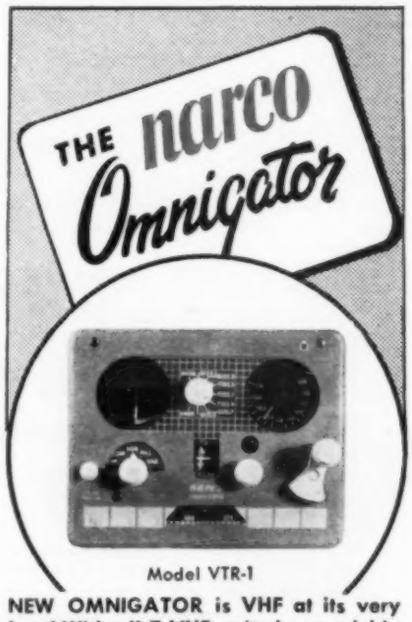
Engine instruments in the cockpit are for exhaust and bearing temperatures, compressor and turbine rpm., propeller rpm., and fuel pressure. A conventional quadrant throttle is used. The single lever actuates the governor-controlled fuel pump.

Power curves for the turbine engine show it to be sensitive to varying air temperatures. Its maximum rating of 200 hp. drops off to 142 hp. at 100 degrees F. Warm air also reduces its fuel efficiency. At inlet air temperature of 29 degrees F., specific fuel consumption is about 1.2 lbs./bhp./hr. At 100 degrees F. it is about 1.43. It is less sensitive to altitude effects on efficiency than piston engines.

In the Luscombe design study, the T-8G-L would use 26 per cent of rated power for optimum cruising speed of 100 mph. Maximum speed is plotted on curves to be 166 mph., at sea level and 174 mph. at 20,000 ft. However, design dive speed of the Luscombe is 172 mph., and design maximum maneuvering speed is 115 mph. under CAA licensing.

Luscombe stressed that the T-8G-L design is for military possibilities only. Cost of the Boeing turbine was not listed. It is still an experimental engine.

"Our design study has furnished sufficient results to warrant serious consideration of the Boeing turbine for use in the existing Luscombe liaison model," summarized Erickson. "For military purposes it offers a practical solution to short-field, rate-of-climb and time-to-climb problems. It offers advantages which are available now. For commercial aviation, it offers future possibilities in specialized uses such as crop applications and patrol. With new airframe designs, the little turbine with propeller will eventually offer many advantages in speed, altitude, cabin pressurization, and other considerations. For example, it is possible to view the small turbo-prop as introducing even greater single-engine reliability than is now achieved—the engine has fewer parts and is not subject to the rotational stress and strain inherent in piston engines. But if multi-engine performance is de-



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sired for larger private planes, such as executive craft, the small turbine offers the advantage of small size, light weight and high-speed efficiency with which performance can be greatly improved when additional engines are cut out for cruising." ★ ★ ★

TEMCO BUCKAROO

(Continued from page 23)

U. S. Air Force Specification 1816. It spins with nose well down and has no tendency to flatten. A slight relaxation on the elevator control while in a spin produces a spiral dive in which the ailerons become completely effective as well as the rudder and elevators." ★ ★ ★

TEMCO YT-35

Performance with 1,975-lb. gross weight. Franklin 6A4-165-B3 engine (165 hp. at 2,800 rpm. for take-off). Semi-controllable Aeromatic propeller.

Cruising Speed (5,000 ft. @ 60% hp.), mph.	132
Top Speed (sea level), mph.	155
Design Dive Speed, mph. IAS	218
Service Ceiling, ft.	15,000
Rate of Climb (first minute), fpm.	900
Range (5,000 ft. @ 60% hp., 33 gals.), miles	590
Fuel Consumption (60% hp.), gph.	7
Landing Speed (full flaps), mph.	56
Landing Distance over 50-ft. obstacle, ft.	740
Take-off Distance over 50-ft. obstacle, ft.	875
Span, ft./ins.	29/2
Length, ft./ins.	21/8
Height, ft./ins.	6/4
Wing Area, sq. ft.	133.5
Wing Loading, lbs./sq. ft.	14.8
Power Loading, lbs./hp.	11.9

***All performance for 1,975-lb. gross, sea level, no wind, unless otherwise noted.**

SUPER NAVION

(Continued from page 19)

round. The old oil dip stick, which formerly had markings for both tailwheel and nosewheel airplanes, now has but a single marking for nosewheel attitude to eliminate confusion. A 20-gal. auxiliary fuel tank is standard equipment, supplementing the 40-gal. main tank.

Ryan says the 1951 model obtains its maximum cruising speed of 170 mph. at 6,000 ft. with the propeller turning 1,765 rpm. and the engine 2,750 rpm. with 23 inches of manifold pressure. This is 75 per cent of rated horsepower from the geared 260-hp. Lycoming engine. With only 50 per cent of power at 11,000 ft., and using 20 ins. of manifold pressure and 2,400 engine rpm., true air speed is said to be 156 mph., with fuel consumption at that setting placed at just under 10 gals. per hr. Sea level rate of climb is 1,250 fpm. at a full gross weight of 2,850 lbs. At sea level, take-off roll is 400 ft., and landing run 470 ft. ★ ★ ★

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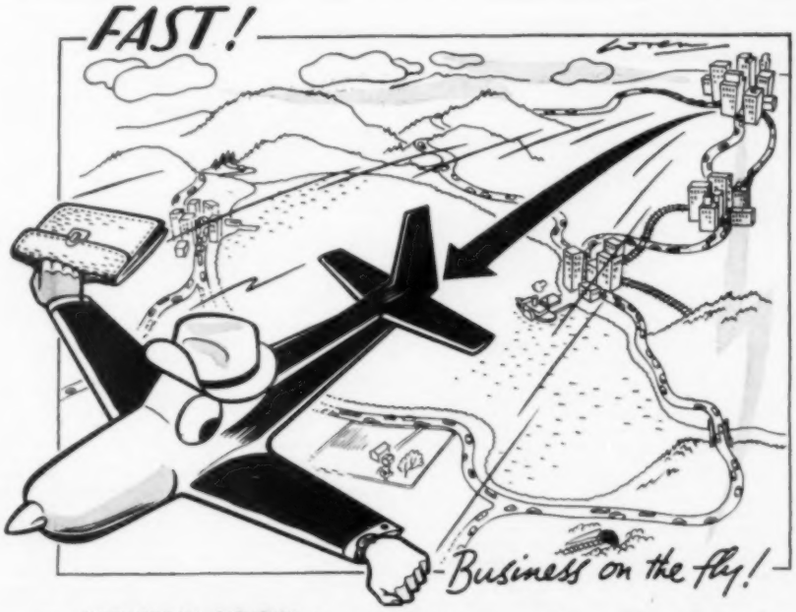

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QUESTIONS AND ANSWERS

(Continued from page 34)

mine may be in the same position as the one in your article. What can I do?

ANSWER: If your airport serves the people who live in your community then it apparently serves a public purpose. If that is the case, you are in much the same position as the private owner in the July article. There is no reason why you and your local owners and pilots can't go to the city government with your problems of zoning. You may be able in time to arouse enough interest locally in airports to get your city government in such a frame of mind that they would consider making a public airport out of yours provided that is what you want.

Don't expect them to spring to your assistance overnight. It is up to you to build up a feeling among your local people that the airport is an asset.

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1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Air Review Publishing Corp., 1901 McKinney Ave., Dallas, Texas; Editor, George E. Haddaway, 1901 McKinney Ave., Dallas, Texas; Managing Editor, Tom Ashley, 1901 McKinney Ave., Dallas, Texas; Business Manager, Fred N. Stones, Jr., 1901 McKinney Ave., Dallas, Texas.

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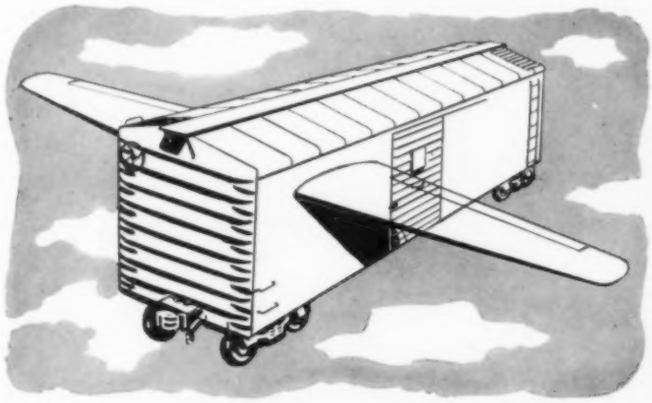

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